

WINTER 2007

Harvard Medical

ALUMNI BULLETIN



THE FASHION
ISSUE



PIONEER

1936

Walter Bradford Cannon, Class of 1900, was as fundamental to the academic and research legacy of Harvard Medical School as the marble wall behind him. As a professor of physiology, he contributed to the development of the neurology curriculum and introduced the case method in its teaching. Cannon also blazed a trail as a researcher, conducting now-classic studies of stomach motility using x-ray technology and pioneering in the scientific study of emotions.

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In This Issue

AT A MARDI GRAS PARTY IN 1968 I LEARNED WHAT POWERFUL SIGNALS medical garments transmit. It was the era of Vietnam and the Summer of Love. A feeling of revolution spiked the air. This revolution, though, turned out not to be political or to change life for the underprivileged. It primarily involved the middle class in a transformation of sexual, pharmacological, and sartorial values. Dress codes were rapidly shifting, and the deference due a tweed jacket or white coat was on the way out.

My principal clinical year came just then. I needed a costume for a party in Cambridge, and I needed it fast. In the middle of a rotation I was not about to hunt down the items required to turn myself into a credible Pancho Villa or Mozart's Queen of the Night. I made a discreet deal with the head OR nurse to borrow full surgical drag: cap, mask, gown, scrubs. I was home free—at least until I got to the party, which turned into the most uncomfortable social occasion of a life that had already had its fair share of interpersonal awkwardness.

My costume elicited an odd combination of fear and loathing from nearly everyone there. Some guests walked to the other side of the room to avoid me. One, whom I had never met before, approached me with apparently sincere accusations about my politics that ranged from the fanciful to the libelous. A few professed in condescending tones not to know what I was supposed to be.

Since 1968 a great deal has changed in the general code of clothing. Rank and role are ostensibly underemphasized. Yet even in 2007 it would be folly to underestimate the power of clothing as communication and, like it or not, the semaphore of garments permeates the doctor-patient relationship. Decoding it has, however, become more complicated. In living memory, medicine and nursing had norms of dress that could be taken for granted and that served the clear purpose of declaring one's role. Vestiges of this practice remain in the length and cut of white coats. But how does one understand these garments? Do they shout authority? Or do they murmur reassurances of competence and caring?

Today I have, at best, an educated guess about my transgression at that party in 1968. I imagine my outfit conveyed the implied threat that the person I was talking to would wind up in a johnny, with his or her backside exposed to every inquiring eye. (A footnote to that speculation: The term "johnny" for "hospital gown" is a term generally confined to the northeastern United States. After our author Ann Marie Menting inquired about it, the editors of the *Dictionary of American Regional English* realized they would need to include the term in future editions.)

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A ROOM OF ONE'S OWN

I thoroughly enjoy reading each issue of the *Bulletin*, and I found the emphasis in the Summer 2006 issue on compassionate care for healing vulnerable people most inspiring and encouraging in this age of cynicism and consumerism.



PHOTO: SERGIO DORANTES/CORBIS

I was especially intrigued by "Curbside Consultation," in which Ann Barnet '55 wrote about the wisdom of breastfeeding. I was breastfed as an infant and was lovingly raised by my nurse mother and my pediatrician father, a member of the Class of 1921, both of whom strongly supported breastfeeding. I, too, became an advocate for breastfeeding when I entered pediatric practice in 1965. I was amazed—and disturbed—that I was one of a mere handful of pediatricians in Baltimore who supported mothers who wanted to breastfeed.

I became acquainted with La Leche League and supported its advocacy programs for many years. I struggled mightily with many obstetrical nurses to allow and encourage mothers to breastfeed from the time of the child's birth. I protested against the hospital practice of sending all mothers of newborn children home with prepared milk samples. Advocating for these mothers became second nature to me, so I have been pleased to find the percentage of breastfeeding women slowly rising in this country since the 1970s.

Providing time and a safe place for breastfeeding mothers should still be a priority in the twenty-first century. Advocacy for breastfeeding continues to be an important practice for physicians.

THOMAS C. WASHBURN '57
FERNANDINA BEACH, FLORIDA

Being There

The "Men of Honor" report in the summer issue covered the splendid talks by the four Nobel laureates who addressed us at Alumni Day in June.

David Hubel's remarks prompted a question from me about the contributions of Steve Kuffler as chair of the neurobiology department in the early 1960s.

Dr. Kuffler was a true friend to the Class of '66, attending our excursions and inviting us to his lab at Woods Hole (best clambake ever!). If Dr. Kuffler had lived, I asked, would he have shared the 1981 Nobel Prize with David Hubel and Torsten Wiesel for contributions to their work? To my satisfaction, Dr. Hubel responded that he thought he would have shared the prize.

So in addition to luck and winning these cash prizes "in the right order," as Dr. Hubel said, longevity is also important. It is a tragedy that the recognition came too late for Steve Kuffler.

LAWRENCE GETTLEMAN, DMD '66
LOUISVILLE, KENTUCKY

New World Order

I was fascinated to read the article comparing aspects of medical care in Canada and the United States in the Summer 2006 issue of the *Bulletin*. After interviewing 3,500 Canadians and more than 5,000 U.S. citizens, a team of Cambridge Health Alliance researchers found that U.S. residents were one-quarter more likely to have unmet health needs, one-third less likely to have a regular doctor, and more than twice as likely to forgo needed medications. Immigrant status showed even more pronounced health care differences. And people of color in this country were more likely to have unmet health needs and a lower quality of care than those in Canada.

I spent my career working with the underserved. Over the years, I have been dismayed by the lack of available health care for the poor, including migrant farm workers, and the wide use of hospital emergency rooms as the only source of health care for the many indigent people in this country. I heartily endorse a universal health care system in the United States, one that would cost less than those in the many developed countries that have such a system. The time is long past for this country to attend to the health needs of its entire population, rather than only those who can afford our medical care system, now the most expensive in the world.

JOHN RADEBAUGH '52
FALMOUTH, MAINE

The Bulletin welcomes letters to the editor. Please send letters by mail (Harvard Medical Alumni Bulletin, 25 Shattuck Street, Boston, Massachusetts 02115); fax (617-384-8901); or email (bulletin@hms.harvard.edu). Letters may be edited for length and clarity.

Joseph Martin and the Amazing Technicolor White Coat

CONSPIRACY THEORIES, SINGING cadavers, and superheroes are not usually the stuff of medical school, but they all had a place in *Joseph Martin and the Amazing Technicolor White Coat*, the centennial production of the Second Year Show. The show was also a satirical sendoff to both the old New Pathway curriculum and Dean Joseph Martin during his final year of leadership.

Song and dance routines avoided formula, exploring everything from '80s pop tunes, such as "Video Killed the Lecture Attendance"—with lyrics that reference the School's lectures being on podcast: "And now the MEC is almost quiet as a tomb, the teachers speak to a completely empty room, and course directors are full of doom and gloom"—to '70s classics, such as "Sweet School of Mine"—set to the tune of Neil Diamond's "Sweet Caroline"—to, of course, show tunes, including several from the production's namesake, *Joseph and the Amazing Technicolor Dreamcoat*.

In *White Coat*, HMS stands for Heroes of Medicine and Science, and the faculty members cum superheroes save lives during global disasters. This time a local disaster



STIFF DELIVERY: Singing cadavers Alexander Kimon, Joel Berley, Eunice McMurray, and Caroline Troy add some life to the anatomy lab in the centennial production of the Second Year Show.

PHOTOS: STEVE GILBERT



has struck, and the faculty is charged with reviving medical education dean Jules Dienstag, who has passed out during an argument over the new curriculum. Our heroes, along with five bickering second-years, are microcellularized and transported inside Dienstag, where they must battle a motley group of pests, including a cross-dressing yeast infection and a Legionnaires' bacterium who sings: "Try the green pus, it's delicious. Don't believe me? It's nutritious! Try to smile, just a sliver; after all, this is the liver."

The heroes discover the ultimate villain, He Who Cannot Be Named, a rapper called Morbidity and Mortality. M&M, as he's known, wants to kill Dienstag so the new curriculum will never be revealed—it

will make HMS students too smart and the bugs won't stand a chance.

Meanwhile, the unconscious Dienstag is found by a spectrum of HMS students: earnest first-years, crunchy Californians, gunners, and Paul Farmer '90 groupies. They pool their skills and attempt to revive the dean, but it takes a couple of fourth-years to save the day—or does it? While the fourth-years perform their acrobatics, Cheyenne, a feminist second-year battling the pests inside Dienstag, defeats M&M in a *Matrix*-style dodge-ball match.

The plot was alternately advanced and interrupted by comic song-and-dance numbers. In Act I, "Bombay Phenotype Bhangra: Dance of the Erythrocytes" mesmerized and "Group A Step" energized. Instead of rival fraternities, this step com-

petition pitted Group A Strep against a team of antibodies. In Act II, the Tahitian dance number "Peristalsis" got the most applause, undoubtedly owing to its sizzling choreography, although the skimpy coconut-shell and grass-skirt ensembles might have helped.

The show was filled with gags and zingers. Martin was portrayed as that other Dean Martin, a highball-swilling crooner; radiology professor Kitt Shaffer's hair was as big as a Buick in the '80s; and genetics professor Clifford Tabin's superhero alter ego was none other than Sonic the Hedgehog, a video-game character that shares the name of a gene Tabin discovered.

The caliber of the performances in *White Coat* suggests that the School is requiring song-and-dance auditions as part of its application process. But excellence on stage has long been a tradition at HMS. Since 1907, the School's second-year students have produced silly and clever vaudeville. Now the inevitable has come to pass: Someone has studied this widespread tradition and published a paper on it. A December 2006 article in the *Journal of Medical Humanities* lauds medical revues as "far from irrelevant and irreverent frivolities." Indeed, they are medicinal, soothing tonics for the edgy, over-cafeinated student and a robust refresher for faculty who don't mind a little flattery. ■

Emily Lieberman is the editorial assistant for Focus.

Old School Ties

THE HARVARD MEDICAL ALUMNI

Association has redesigned its website to facilitate communication among alumni and between alumni and the School. Visit www.hms.harvard.edu/alumni to learn about reunion events and to connect to a variety of resources. ■



GREEN THUMBS UP: Former Vice President Al Gore and actress Meryl Streep present Prince Charles with the Global Environmental Citizen Award. The director of the Center for Health and the Global Environment, Eric Chivian, is at left.

PHOTO: MIKE SEGAL/REUTERS

Fresh Prince

WHEN WELLINGTONS, THE UNOFFICIAL FOOTWEAR OF GREAT BRITAIN, BECAME

a fashion accessory a few years ago, gardening gained a new gleam and Prince Charles adapted the hae as his earthy emblem. In January, the Prince of Wales received the Global Environmental Citizen Award from Harvard Medical School's Center for Health and the Global Environment, in part for his dedication to organic farming.

"We cannot think of a person more worthy to receive this year's award," said Eric Chivian '68, director of the center and co-recipient of the 1985 Nobel Peace Prize. "For decades, His Royal Highness the Prince of Wales has been a leading international voice in protecting the natural world. We are delighted to honor Prince Charles, whose life's work has so effectively carried out the center's mission—helping people understand that their health depends on the health of the environment and motivating them to do everything in their power to protect it."

Prince Charles has publicly voiced his concerns about the natural environment for decades through advocacy and practical initiatives, such as converting the farm at Highgrove, his country home, to organic methods.

In 1992, the prince launched his own food company, Duchy Originals, to help small farmers find a new market for their goods, while at the same time offering consumers natural food and promoting more sustainable production methods that improve soil health and protect the environment. The first Duchy Originals product was a British biscuit made from wheat and oats grown organically at Highgrove. Since then, the company has expanded to become one of the United Kingdom's better known and more successful organic and natural brands, with more than 200 different products. Duchy Originals generates more than £1 million—nearly two million in U.S. dollars—in profit for charity each year.

Using Highgrove as a successful example of sustainable farming, Prince Charles has led the way for a transition toward sustainable practices in the United Kingdom, warning about the risks of genetically modified food, calling for research into the health effects of chemical farming, and establishing a number of rural development projects.

The Global Environmental Citizen Award is presented annually by the Center for Health and the Global Environment to someone who does outstanding work toward protecting the environment. The ceremony was held in New York City in January. Past award winners include former Vice President Al Gore, Edward O. Wilson, Harrison Ford, Jane Goodall, and Bill Mayers. This year's award celebrated the center's tenth anniversary. ■

Speak Your Peace

I'VE WRITTEN MY SHARE OF PRESCRIPTIONS SINCE graduating from medical school more than five decades ago. As an internist, many of my scripts have been for medications that moderate pressures within or help temper those from without. For me, the goal always has been to recognize early the signs of trouble and to calm them or, better, to block them altogether.

Twenty years into my practice, I realized that treating individual patients was only part of my duty as a physician. I kept witnessing health emergencies—whether stress-induced heart attacks, bones broken from domestic abuse, or injuries from neighborhood violence—that resulted from a lack of peace within individuals, families, or communities. My

I asked whether anyone there represented *The Sydney Morning Herald* or *The Australian*, the nation's two premier dailies. I introduced myself to the several men identified as affiliated with those papers. I told them I was an Australian living in the United States and that I believed I had some important recommendations that would add a new dimension to Anzac Day. I could see—and feel—their skepticism. But they did slow their departure preparations. Better yet, a small group gathered to listen.

Anzac Day commemorates April 25, 1915, when an Allied force composed of the Anzac—the Australian and New Zealand Army Corps—and French and English forces were directed to land on Gallipoli Peninsula south of what is now

Twenty years into my practice, I realized that treating individual patients was only part of my duty as a physician. I decided to return to Australia, my home nation, to write a prescription for peace.

thoughts kept returning to the lack of peace I had felt during my troubled childhood in Australia. I decided to return to my home nation to write a prescription for peace.

New Horizon

My mission began in 1976 when I traveled from San Francisco to Sydney. The nighttime leg took me from Honolulu to Suva, the capital of Fiji. The hours of dark travel ended as we approached Suva: The beautiful pale orange of the rising sun on the wings of the plane helped damp, if only for a moment, my terror of flying. Another takeoff and six airborne hours later and my plane was circling Sydney. I felt relieved; I would arrive in time to make the newspaper deadlines for Anzac Day, an annual commemoration that honors the thousands of Australians who died in a major battle early in World War I. The first phase of my plan was about to launch.

After shepherding my suitcase through customs, I asked where I could find the airport's press room. I was directed to a space hosting a group of men—and one woman—of diverse ages, from young, unseasoned reporters to older veterans. They were not in the best of moods: They had just been stood up by a famous Hollywood actress who had been scheduled for my flight. When I walked in, they were busy packing their bags.

known as Istanbul. Their mission was to open an entrance to the Black Sea so Russia could be supplied. The battle proved devastating to the Allies: The Turks held the high ground and fired down on the landing forces with machine guns. Although the Allies succeeded in landing, the withering fire eventually forced them to withdraw. More than 8,000 Australian soldiers died in the battle.

Since then, Australia has held an annual remembrance on the anniversary of that historic battle to honor the Anzac soldiers who lost their lives during it. Throughout the country, the day traditionally opens with dawn services of hymns, prayers, and brief homilies about the sacrifices of Australian veterans. Processions of local veterans follow, their wartime past remembered not by uniforms but by the military medals pinned to their coats, jackets, or shirts. Those no longer alive are also remembered by medals worn by their children or grandchildren. I marched in several of these processions in Canberra, with my father's two World War I medals on my chest, silently testifying to his service.

I spoke passionately to the reporters, telling them that I strongly favored the continued commemoration of these events. But, I added, I worried that interest was waning. The previous year I had noticed changes. Fewer veterans were marching from the two world wars, and fewer personal messages were handwritten on floral tributes.

I added that I wanted to present some new ideas for revitalizing Anzac Day. The commemoration should relate more to the present and future, I said, and it should expand to acknowledge people who were today working for peace. We could achieve these goals by awarding a prize, the Anzac Peace Prize, for research into ways to prevent future wars. In addition, we could bestow Anzac of the Year awards on ordinary citizens who had accomplished something outstanding for their communities.

The lone female journalist scoffed. There was nothing unusual about a peace prize, she said, because everyone supports peace; what I was proposing was nothing new. I argued that my proposal was special. Anzac Day had become a dry and grim commemoration of the past rather than a celebra-

tion of all the good that could stem from the sacrifices of those who died that day.

The reporters were closing their notebooks and the photographers were hoisting their bags on their shoulders. I needed to seize their imaginations quickly. So I declared that Anzac Day should infuse Australia with its highest idealism, inspiring men and women to work together to achieve lofty goals, provide service to those with disabilities, and foster mutual concern for one another. I went on to mention that Australia, as a continent, had no foreign borders and was thus ideal as a center for peace-related studies.

I must have sounded convincing because the atmosphere shifted. The photographers hauled out their equipment again, and the reporters flipped open their notebooks. Camera crews set up lights and began taping, and I suddenly found myself being interviewed for the evening news.

One Small Step for Mankind

The next morning I was elated to see a strong article in *The Sydney Morning Herald* with the headline, "Doctor's Peace Prize Plan." *The Australian* ran a major article as well, along with an editorial titled, "And Why Not an Anzac Peace Prize?"

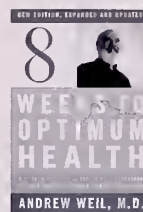
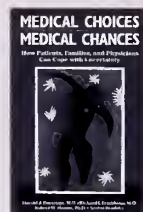
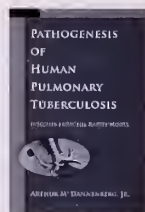
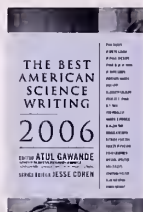
After two years of meetings with a major veterans group and correspondence with the prime minister, Australia adopted my plan. The peace prize has since been awarded to 25 individuals or groups, while nearly 200 others have been named for the Anzac of the Year award.

More recently, back in the United States, I founded January Peace, a website focused on peace education. I believe that learning to promote personal, familial, communal, and world peace requires skills that we all need to develop. This initiative guides the efforts of anyone interested in building such skills and adding his or her personal commitment to that of others devoted to social change for global peace.

The initiative, together with the strengthened Anzac Day celebrations and the ongoing Anzac of the Year presentation, will, I hope, long remain as testaments to one physician's prescription for world peace. ■

Geoffrey Paul '56 has retired from his position as an internist at Kaiser Permanente in San Francisco.





The Seduction Theory in Its Second Century

Trauma, Fantasy, and Reality Today, edited by Michael I. Good '70 (International Universities Press, 2006)

This volume gathers the current thinking about Sigmund Freud's theory on the role of passive and traumatic early childhood sexual experiences on the adult psyche and how that theory resonates today. The editor also provides the history behind the theory, beginning with the story of Adam and Eve.

The Best American Science Writing 2006

edited by Atul Gawande '94 (Harper Perennial, 2006)

As Gawande states in his introduction to this collection of 21 essays, defining science writing sometimes gets "squishy." Some pieces are loosely about science—such as the one about a man hired by a sheikh to create the world's best computer chess program—while others wade through the thickets of contentious science—such as the article on genetic evidence for homosexuality. But they all tell fascinating stories.

Fed Up!

Winning the War Against Childhood Obesity, by Susan Okie '78 (Joseph Henry Press, 2006)

Okie, a family physician and medical journalist, contends that childhood obesity has reached the level of public emer-

gency—about 20 percent of children worldwide are overweight—and our modern environment is the culprit, not genes. She reviews the science, examines several programs aimed at teaching children to adopt healthier lifestyles, and scrutinizes the possible role the fetal environment may play in contributing to future obesity.

Pathogenesis of Human Pulmonary Tuberculosis

Insights from the Rabbit Model, by Arthur M. Dannenberg, Jr. '47 (ASM Press, 2006)

Dannenberg, an expert in the field of tuberculosis, investigates the pathology and structure of tuberculous lesions and discusses the histochemistry of macrophage activation and the effects of various treatments, such as irradiation. He also reviews the principles of immunization against tuberculosis, including vaccine development, and he provides a guide for future research.

Medical Choices, Medical Chances

How Patients, Families, and Physicians Can Cope with Uncertainty, by Harold J. Bursztajn '76, Richard I. Feinbloom, Robert M. Hamm, and Archie Brodsky (iUniverse, 2006)

This book urges physicians and patients to become comfortable with uncertainty in medicine, just as physicists recognize a degree of uncertainty in their science. The authors explore the evolving nature of the doctor-patient relationship in the

new millennium as families and individuals cope with uncertainty. At the same time, the authors describe tools to help one regain control from managed care.

8 Weeks to Optimum Health

A Proven Program for Taking Full Advantage of Your Body's Natural Healing Power, by Andrew Weil '68 (revised edition, Knopf, 2006)

Weil believes people can change their habits, as he once did at age 29. He recommends natural remedies and lifestyle changes to achieve optimum health, with special considerations for men, women, people in certain age groups, and those at risk for cancer and cardiovascular disease. In addition to recipes for healthful meals and exercise regimens, Weil suggests news fasts and breathing techniques.

To Die Well

Your Right to Comfort, Calm, and Choice in the Last Days of Life, by Sidney Wanzer and Joseph Glenmullen '84 (Da Capo Press, 2007)

The authors emphasize that dying well means staying in control of your life, even at its end. They devote several chapters to a patient's choice to hasten death and one to the use of helium to do so. Included also are discussions of patients' rights, palliative care, and dementia. Cases and personal stories provide the book with additional depth, and sample forms, such as medical proxies and living wills, increase its practicality.

Next

by Michael Crichton '69 (*HarperCollins*, 2006)

YOU CAN MANAGE FAIRLY WELL IN LIFE WITHOUT READING MICHAEL Crichton '69, but at a certain point you become aware of your cultural illiteracy. Without reading his books, you are not a member of an international phenomenon. You may vaguely know he had something to do with *Jurassic Park* and *The Andromeda Strain*, and there was that movie about Japan. You might have meant to investigate. But life got busy—medical school, residency, marriage, mortgage, children—and somehow the years passed without your cracking the spine of one of his novels. You and Michael Crichton coexisted in busy, non-intersecting worlds. To tell the truth, you never gave him a thought. And without doubt, the reverse also was true.

But things change. Recently I was sent the latest Crichton novel, *Next*. I read it straight through. It left me with thoughts on what it takes to be an international phenomenon. My thoughts on the book weren't as clear.

In this novel, protagonist and antagonist are one and the same: the human genome, removed from its role in the natural plan in order to be manipulated, patented, sold, and used without regard to ethical or scientific consequences. All the rest is elaboration. Transgenic parrots, polylingual orangutans, biogenetically created living works of art, advertisements implanted by PR firms into genetically altered fish—they are among dozens of minor actors who appear and disappear for our entertainment. Alongside them run several persistent storylines. One involves a transgenic chimp that is chimp-napped from a primate center by his human father. Another involves a cancer survivor whose resistant genes have been marketed to great profit without his knowledge. Next thing you know, there is a bounty hunter and an unmarked van chasing his innocent grandson, whom they believe has the same cancer-proof gene. Things get busy.

The book is crammed with subplots, something for everyone—kidnappings, courtroom scenes, car chases, cold sex between unsympathetic parties. Each human character—and there are dozens—has one personality feature inflated to parade-balloon proportions. They are like cosmetic surgeries

gone awry: the mercenary CEO, the ambitious and soulless genetic researcher, the sleazy defense attorney. Only the adoptive mother of the transgenic chimp shows some complexity; running her hand absentmindedly through the terrified boy-chimp's hair, she realizes with a shudder that she is grooming him exactly as his chimp mother must have. She feels repelled and yet relieved she has finally found a way to comfort him. It is a pleasure to meet her.

It may bother some readers that Crichton gives so much color and stamina to his what-if concepts while his human characters go without. But humans are merely vectors for ideas

here. To make the point clearer, chapters are interrupted by news bulletins taken from real sources and mock articles from scientific presses and mainstream papers. They are clever transmissions from the genetic future as the author envisions it: "Scientists Grow Miniature Ear in Lab" (Massachusetts Office of University Technology Transfer); "Neanderthal Man: Too Cautious to Survive?" (purportedly *Science* magazine); "New Transgenic Pets on Horizon"; and my favorite, "Blondes Becoming Extinct" (BBC). A great deal of writing thought and effort has gone into them, and regular page-flipping is required to keep everything tidy. As a result, one feels in peak

intellectual condition, keeping up with the brisk pace Crichton has set. (This may be one of the reasons for the international phenomenon he has become: We all want to feel as intelligent as the writer we are reading.)

Next ends, rather oddly for a blockbuster, with a scholarly list of conclusions the author has drawn about gene patenting (he is against it), research bans (ditto), and for-profit university genetic research (thumbs down again). There is even a bibliography for those beach readers who want to delve into the technical points of genetic engineering, evolutionary psychology, eugenics, embryology, cloning, and intellectual property law. The book means to be rip-roaring entertainment, unsmiling prediction, and serious commentary all at once.

In the world of international phenomena, grand ambitions—three books in one!—are probably commonplace. In the real world, it is a hard trick to pull off. Time and science will tell which book *Next* is. I have my humble suspicions. ■

Elissa Ely '88 is a psychiatrist at the Massachusetts Mental Health Center.



Line of Attack

FOR ME A PICTURE MUST BE AN amiable thing, joyous and pretty—yes, pretty! There are enough troublesome things in life,” the French impressionist Pierre-Auguste Renoir wrote, barely hinting at his own misfortune. Renoir struggled for decades with one of the most debilitating and disfiguring of diseases, rheumatoid arthritis. The disorder, which struck when he was 50, would slowly erode the cartilage and bone of his hands, shoulder, and feet and lay waste to other parts of his body.

The great master had only his art—and the occasional visit to a spa—to see him through. A century later, there are various treatments for rheumatoid arthritis, but they do not always alleviate patients' suffering. Most quell the immune system's attack on the tissue lining the joints, a defining event in the disease. Yet this attack is but one aspect of a complex, often variable disease.

In a surprising new twist, it now appears that, once attacked, the joint lining, or synovium, may not only ramp up inflammation in the joint but also begin to erode the cartilage. David Lee, an HMS assistant professor of medicine at Brigham and Women's Hospital, and Michael Brenner, Theodore Bevier Bayles Professor of Medicine at the Brigham, have identified a protein that coordinates the synovium's destructive activities. Their findings, published in the February 16 issue of *Science*, could usher in new treatments for the joint-wasting disease.

A Joint Endeavor

Several years ago Lee, Brenner, and colleagues identified a protein in the synovium, a delicate but dense wisp of cells, that makes the cells of the tissue stick together and form a compact, tightly organized structure. The discovery spurred Lee to explore the role of that protein, cadherin-11, in living animals, by comparing cadherin-11-knockout mice with wild types. In contrast to the wild-type synovium,

with its neat rows of cells, that of the knockouts appeared sparse and desultory, confirming cadherin's role in shaping the synovial tissue.

When Lee and colleagues tried inducing rheumatoid arthritis in the cadherin-11-deprived mice, the animals barely showed signs of disease. Not only did they suffer less cartilage loss, but their levels of inflammation were about half those found in similarly treated wild-type animals.

Lee and colleagues also tried blocking cadherin-11 in the wild types before inducing the disease. The mice resisted disease, much like the knockouts.

These findings hold obvious implications for treating humans and point to the possibility that the principle underlying their approach—that tissues, once attacked by the immune system, may actually stoke inflammation—could have broader applicability.

Casting Call

Rheumatoid arthritis is thought to begin when the immune system attacks the synovium, though it is still not clear what causes this attack. Once inflamed, the synovium balloons, forming a thick,



LASTING IMPRESSIONS: For nearly half of his artistic lifetime, Pierre-Auguste Renoir suffered such severe rheumatoid arthritis that he could not grasp a brush. Undaunted, he would ask that the tool be affixed to his gauze-wrapped, balled-up hands.

Marshmallows Optional

A

MAJOR PROBLEM FACING

Americans and Europeans is the dangerous rise in blood pressure with age, increasing their risk of heart disease and diabetic complications.

Kuna Indians living off the Caribbean coast of Panama don't have that problem. Narman Hallenberg, an HMS professor of radiology at Brigham and Women's Hospital, is convinced that it's because they drink more than five cups of cocoa a day.

In research published in January in the *International Journal of Medical Sciences*, Hallenberg reports that Kuna who continue drinking cocoa in their home islands enjoy much lower death rates from heart attacks, stroke, diabetes, and cancer than those who move to mainland cities and suburbs.

Hollenberg used natural cocoa in his experiments. This substance is chockfull of flavanols, antioxidant compounds found in cocoa beans. Sadly for chocolate lovers, getting cocoa out of nature and into a box on a shelf removes much of the flavanols. Kuna cocoa has been found to be richer in flavanols than any cocoa product now available in the United States or Western Europe.

Surprisingly, laboratory tests also showed that Kuna cocoa stimulates the body to produce nitric oxide, a natural compound present in cigarette smoke and automobile exhausts. Nitric oxide, though, has a good side, as a component in an internal regulatory system that, among other actions, relaxes the blood vessels to allow an increased flow of blood and oxygen to the heart, brain, and other organs. Hallenberg believes that flavanols somehow activate a gene or genes that make nitric oxide.

Hallenberg conducted experiments in which healthy people who were at least 50 years old drank flavanol-rich cocoa. Blood flow increased in these subjects just the way it did when he administered the same type of test to healthy young people, leading Hallenberg to speculate that flavanol-rich cocoa may be a valuable addition to treatments for conditions such as stroke and so-called vascular dementia, both of which involve restricted flow of blood to the brain.

He envisions new types of flavanol drugs being developed for treating type 2 diabetes and preeclampsia. The latter is a serious condition that affects about 7 percent of pregnant women in developed countries and more than twice that number in some African nations. Among Kuna women, however, preeclampsia is rare. ■

William J. Cramie is a staff writer for the Harvard University Gazette.



shroudlike structure, or pannus, that begins to chew its way along the cartilage-covered bone, initiating the destructive, bone-wasting phase of the disease.

Brenner was intrigued by the synovium, especially as little is known about its structure, and decided to investigate further its role in the disease. The veil-like tissue is loaded with cells that respond quickly to infection.

Brenner also was interested in the cadherins, cell-adhesion molecules that bind to one another instead of to different kinds of proteins. He found that cadherin-11 worked in the synovium and was responsible for prompting its cells to stick to one another and to line up in neat rows.

The findings showed that the protein helped to organize the normal synovium and played a critical role in the formation of the pannus, not just its bloating—it was skimpier in the knockouts—but also its subsequent crawl along the bones: When cultured, the cells of the pannus migrated less than those of wild-type mice. Lee and Brenner believe that cadherin-11, in addition to allowing the cells of the synovium to bind to one another, directs the cells to migrate across and, eventually, to invade and destroy the cartilage.

Its ability to instigate both inflammation and cartilage damage makes cadherin-11 an appealing drug target, either alone or with existing therapies.

The new study could raise the profile of the cadherins, which have been, according to Brenner, “low-liers” in the medical world. “Can we take what we have learned about cadherin-11’s role in rheumatoid arthritis and think about other autoimmune and inflammatory diseases?” he asks. “The liver, the kidney, the heart, brain, and skin—to what degree do those tissues and the cell types in those tissues, and the cadherins on the cell types, influence the way those tissues respond to inflammation? Is this a model for looking at disease in other contexts?” ■

Misia Landau is a senior science writer for Focus.



dressed not to kill

The fashion of physicians has been subject to some innovation, a little whimsy, and the long search for the perfect ensemble.

by ANN MARIE MENTING



OFF THE CUFF: A surgeon at Boston City Hospital, back when it was affiliated with Harvard Medical School, simply rolled up his sleeves to begin work. An apron covered his clothing, but he wore no cap, mask, or gloves.

THIS IS A STORY OF SYMBOL AND SCIENCE, OF the extraordinary being expressed through the practical, of competition, and even of love. This is a story that spins through time, one woven with history and tied with myth. This is a story of physicians, of hospitals, and of lives saved. This is a story about what doctors wear.

February can be a harsh month in Massachusetts, but as Oliver Wendell Holmes put the final touches on the speech he would deliver that month in 1843, he focused on a harsh reality of a different sort. Holmes, Class of 1836, was preparing to relate to the Boston Society for Medical Improvement a “long catalogue of melancholy histories” involving cases of puerperal fever. This litany of sadness and death was not all Holmes would present; he was also preparing to suggest the audacious: that physicians could contain, possibly even curtail, the spread of this infection among their female patients by modifying their personal hygiene regimens.

Holmes’s presentation, “On the Contagiousness of Puerperal Fever,” drew upon his observations, common sense, and bedside experience. And his suggestions—that physicians who tend women with this condition “change every article of their dress” after the visit, perform a “thorough ablution” of their persons, and wait 24 hours or more “before attending to any case of midwifery”—would be not simply a hard sell but a close cousin to fighting words. It was difficult for physicians of his time to accept that their personal cleanliness could play a role in the health of their patients. Where, they asked, was the evidence? Their skepticism was understandable: Holmes’s suggestions were not moored to the science of the past. They forecasted facts of the future.

Badges that Discourage

To appreciate hospitals and patient care in the early to middle nineteenth century it is necessary to engage the senses. To enter the hospital of the day was to step into a chamber of fetid aromas emanating from flesh that was losing its battle to such bacterial infections as gangrene, pyemia, septicemia, erysipelas, tetanus, and puerperal fever—conditions collectively referred to as “hospitalism.” Moans and cries from patients on the wards were often punctuated by screams from patients in the surgical theater. Until anesthesia was

publicly introduced by HMS faculty in 1846, surgeons tried to minimize their strapped-down patients’ exposure to pain by working with all possible dispatch. A blur of motion, they often completed amputations in seconds and wound closings and dressings in mere minutes.

Time spent operating was nearly matched by that spent in preoperative preparation. Surgeons readied for their task by simply rolling up their shirtsleeves and pinning well-waxed silk ligatures to the lapels of their operating coats.

The coats themselves bore histories of their owners’ surgeries. Covered, usually crusted, with blood and pus, the garments were hung on hooks after one surgery and shrugged off before the next, a sequence of use that would repeat—unbroken by a cleaning—throughout the decades of a physician’s tenure.

Some considered their coats to be statements. In *Memoirs of a Small-Town Surgeon*, John Brooks Wheeler, Class of 1879, tells of the blue broadcloth garment the senior surgeon at Massachusetts General Hospital wore. With its velvet collar and long tails, the tunic had once been natty enough for home and street wear, but the years’ toll had rendered it sufficiently shabby to qualify as surgical garb. Stiff with blood and other dried fluids, the coat was sported by that surgeon throughout the four years Wheeler spent at the hospital. The young Wheeler avoids speculating on where those four years fell in the surgical lifetime of the garment.

Given these conditions, it may not be surprising to learn that hospitalization and surgery were considered last-ditch efforts reserved for the poor and the hopeless. Statistics from the period provide some grim detail. In antebellum America, hospitals lost nearly 25 percent of amputation patients, as recorded by institutions such as Massachusetts General Hospital and Pennsylvania Hospital. In Europe, mortality rates for such patients were even greater: 43 percent reported by infirmaries in Scotland, 46 percent at Zurich’s surgical hospital, and 60 percent in hospitals in Paris.

1846

WHAT A KNOCKOUT:

The dapperly dressed surgical team at Massachusetts General Hospital, led by John Collins Warren, standing second from the right, demonstrates the use of ether anesthesia, an innovation that freed surgeons from the need to speed their task to minimize the patient’s pain.

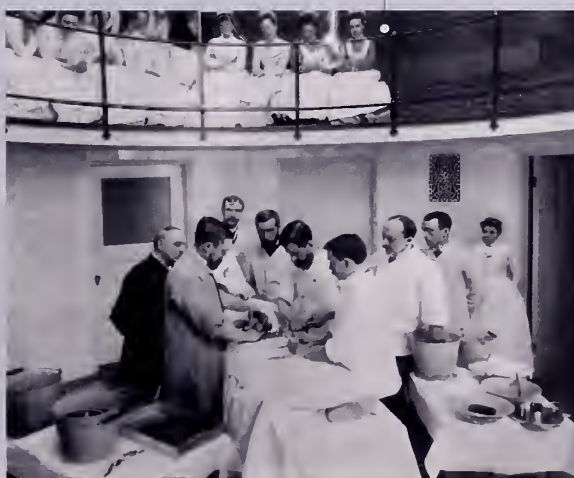




1870s

PLAY MISTY FOR ME:

Spraying the operating field—as well as instruments, dressings, and surgeon's hands—with carbolic acid, as shown in this mid-nineteenth century picture—was a hallmark of the new antiseptic technique in surgery, an advance pioneered by the British surgeon Joseph Lister.



1889

UNDER COVER: Operating-room fashion in the late 1880s included freshly laundered coats that covered the street clothes of surgeons and assistants. The fashion, though, had yet to embrace the use of gloves, caps, or masks, as indicated in this picture of a surgical team working in the Brodlee Ward of Massachusetts General Hospital.

Holmes was not alone in deploring this state of affairs. But he and his reformist peers made little headway until Joseph Lister rewrote convention.

Yet infections stemming from surgical conditions could not receive all the blame; mortality rates for other hospitalism infections were similarly stark. John Bell, reporting in his *Principles of Surgery* about one Paris hospital, sums up the situation of that time, "It was the gift which the Hôtel-Dieu, the House of God, dispensed to all who sought or were forced into its charitable wards, so that no less than twenty-five out of every hundred who entered living were borne out dead."

Rinse and Repeat

Holmes was not alone in deploring this state of affairs or in seeking ways to correct it. But he and his reformist peers made little headway until a British surgeon, Joseph Lister, rewrote scientific convention.

In the mid-1850s while serving as a surgeon in Scotland, Lister had become appalled at the rates of infection surrounding him. To change this, he implemented new hygiene and sanitation practices on his wards. And he began testing different methods for treating wounds. A series of failures ended when he came across the findings of French chemist and biologist Louis Pasteur and realized it was the introduction of microorganisms into the wound that caused the infections.

Knowing the enemy, Lister could now devise a way to eliminate it. His choice: chemical intervention. He began to expose surgical instruments, incisions, and dressings to differing concentrations of carbolic acid, a sewage deodorant of

the time. His results, when published in *The Lancet* in 1867, showed that even the usually fatal compound fracture could heal without becoming infected provided the surgeon's hands, surgical field, wound, and dressings were cleaned, soaked, or kept wet by a solution of carbolic acid. The age of Listerian antisepsis had dawned, and the camps for and against it quickly formed.

Acolytes of the Listerian method sought knowledge from the source; by the early 1870s physicians such as J. Collins ("Coll") Warren, Class of 1866, and Henry Orlando Marcy, Class of 1864, were returning from Scotland armed with knowledge they hoped to implement. It was not easy; at Massachusetts General Hospital, Henry Jacob Bigelow, Class of 1841, doubted Lister's methods and blocked their implementation. Marcy, in a break from the constraints of that institution, set up his own clinic where his rules for antisepsis included the requirement that all members of surgical teams wash their mouths out with a solution of carbolic acid before beginning any procedure—foreshadowing, perhaps, that Lister's accomplishments would be immortalized in the United States through the name of a mouthwash.

Physicians elsewhere embraced Lister's technique—and cleanliness thesis. An early convert and proselytizer was Gustav Neuber. By 1883, this German surgeon was chemically sterilizing the implements and field of his operating room in Kiel. He also was the first physician to require sterile gowns for members of his surgical team.

1901

A UNIFORM APPROACH:

German surgeons, such as Vincent Czerny, the bearded but bare-headed surgeon in the center of the picture, were early adapters of gowns and other items proposed for wear during surgery. The German surgeon often introduced these concepts during his travels, as perhaps during this visit to Cooper Medical College in San Francisco.





1905

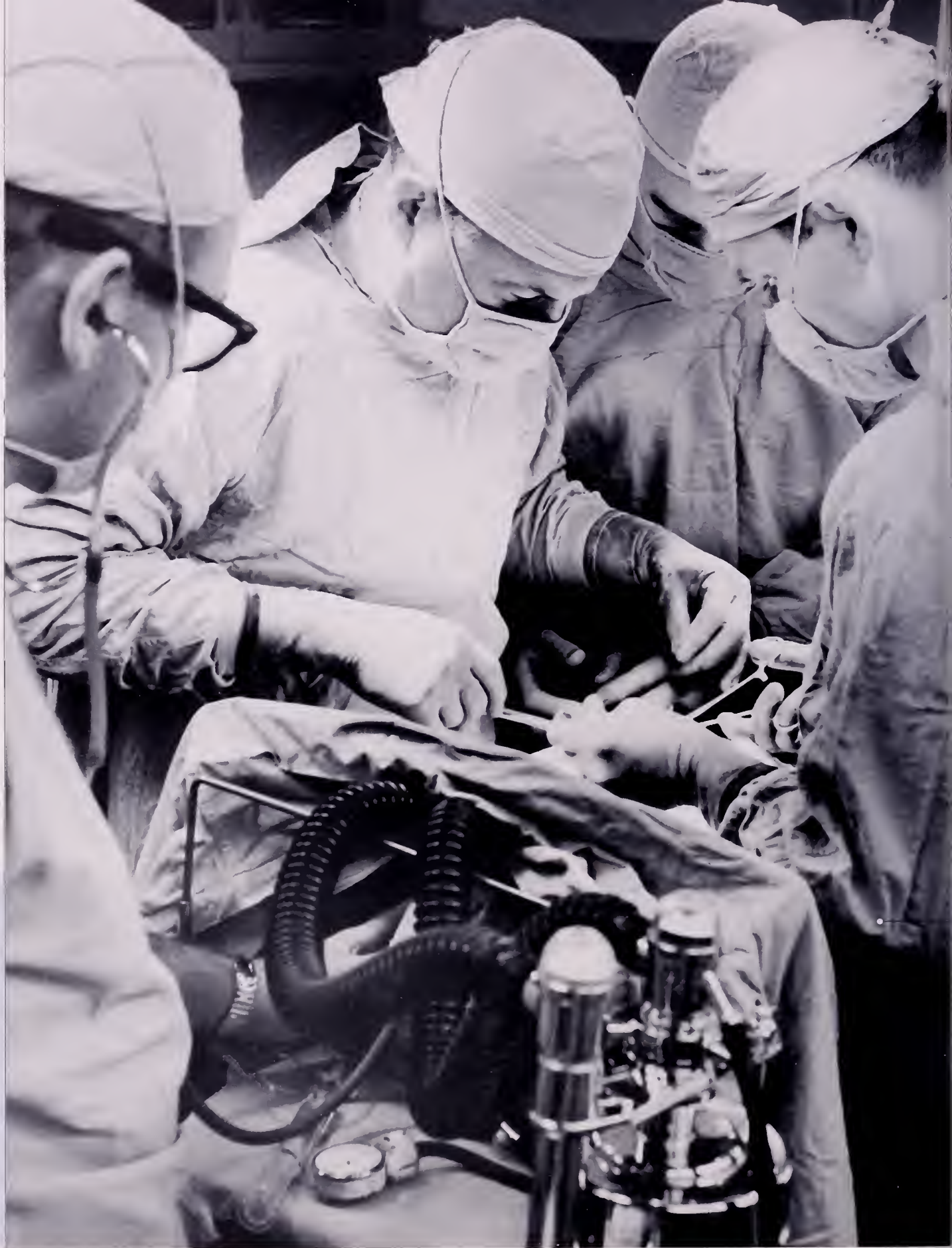
CUTTING-EDGE FASHION:

This early twentieth-century surgical team at Massachusetts General Hospital shows many of the sartorial changes then sweeping the profession: long-sleeved gowns, caps, and cloth or rubber gloves.



1932

SPOT ON: Rigged with spot lighting but no surgical cap, Horvey Cushing, Class of 1895, wears a gown, gloves, and a mask as he operates before a gathering of Cushing Society members at Peter Bent Brigham Hospital.



White, carrying with it the attributes of life, innocence, purity, cleanliness, and candor, became the visual definition of doctoring.

The White Stuff

Gowns were not exactly new for surgeons; thirteenth-century barber surgeons were allowed to wear long robes as they plied their trade, thus distinguishing themselves from lay barbers, to whom short robes were consigned. The advent of antiseptic technique and the rising importance of laboratory analysis in medicine, however, spurred a move to adopt clothing that reflected cleanliness and science.

As the nineteenth century drew to a close, medicine embraced science to a degree previously unmatched. Reforms included moves for an overall costume change, one that answered the needs of antiseptis and economics. In 1894, Hunter Robb, a gynecologist at Johns Hopkins Hospital, wrote in his *Aseptic Surgical Techniques* that surgeons should wear specially crafted suits that could be easily sterilized. These, he suggested, could be constructed of a "twilled muslin, costing about 13 cents per yard."

John Allen Hornsby gave similar recommendations in his 1914 manual *The Modern Hospital*. Hornsby, then the director of Michael Reese Hospital in Chicago, suggested that special garments be worn by all who entered the hospital precinct. These garments included knee-length, back-tied operating gowns for surgeons, house coats for visiting physicians who were making rounds, and sleeveless mantles "almost like a pillow case...for visitors in the maternity and children's departments and in the operating rooms." Each version, according to Hornsby, should be fashioned from "drilling or Indian head" or, in a pinch, from similar

cotton goods. Hornsby and Robb agreed on the necessary color: white.

The pervasiveness of white in hospitals and scientific laboratories welded the symbolic attributes of the color onto the profession, according to physician and medical anthropologist Dan Blumhagen. And as medicine increasingly became cloaked in science, the more tangible characteristics of the two disciplines became linked in the mind of the public. White, carrying with it the attributes of life, innocence, purity, cleanliness, and candor—the latter firmly rooted in the Latin *candidus*, bright white—became the visual definition of doctoring. And the calling card bearing that message? The physician's white coat.

The Hierarchy of Hem

Among items that speak of personal and professional hygiene, few can match the power of a screaming clean white coat. And as nineteenth-century science and scientists began to migrate from the laboratory to the hospital—and physicians began the trek in the opposite direction—the universal adoption of the white coat allowed for a seamless exchange. The garment did, however, need to fill certain requirements, at least according to Hornsby: "These coats should be made with some regard to pattern, which makes an excellent impression on the observer if the physicians...have on well-made and well-fitting coats....[As for closures] there is no button that will go through the laundry....Tapes do not look well, and physicians and surgeons will not tie them....There seems, therefore, to be only one form of fastening, that of the brass snap button."

Besides enhancing professional carriage, the coats were decidedly practical. They covered one's street clothes, saving wear and tear while also, as needed, masking fashion sins. They said "Doctor," thus allowing their wearers to avoid the pronouncement. And they had pockets. Physicians could carry critical tools while leaving their hands free to probe, prod, or comfortingly pat their patients. To-do lists and pens or pencils have consistently been common contents, often sharing space with the wisdom of the *Pocket Pharmacopoeia*, the *Washington Manual of Medical Therapeutics*, or, in contemporary times, the fully loaded personal digital assistant. Perhaps best of all, the coat's pockets have provided a home from which the curved horns of that signature tool, the stethoscope, can peek.

The coat also acts as a semaphore, signaling to those in the know the rank of the wearer. Tradition has it that medical students and often residents wear short coats while the coats of attending physicians tastefully touch the knee. One of the few institutions to buck that tradition has been Massachusetts

1961

INTELLIGENT DESIGN:

Robert Grass '31 and members of his early 1960s surgical team sport a complete surgical ensemble, one that, except for technological improvements in materials and slight modifications in design, remains in use.



HOUSE STYLE: Contemporary surgical wear combines fit and function, enabling surgeons such as Atul Gawande '94 (center) and colleagues at Brigham and Women's Hospital to carry out their work without constraint—and without contamination of patient or field.

General Hospital, which, until recently, took an egalitarian approach by clothing all ranks—student through attending physician—in short coats. By the 1920s, however, most of the nation's hospitals had adopted the long, white "lab" coat as on-the-ward wear for their physicians.

Blue's Anatomy

Once coats and gowns were convention, street clothes became the next item to receive a sartorial makeover, becoming swapped for white pants and shirts as physicians scrubbed in for surgery. These "scrubs" provided yet another barrier to bacteria shed from the skin of surgeons and their attendants. Soon, with the acceptance of the pants uniform by nurses, surgical teams began to take on the look of, well, a team.

In 1914, a San Francisco surgeon, Harry Sherman, recognizing that the whites and lights of surgery hurt the eyes of surgeons and their teams, suggested using instead a complementary color of hemoglobin—green, specifically spinach green. This color provided many benefits: Studies showed it eased eye strain, was psychologically cool, and allowed surgeons to maintain their visual acuity to pinks and reds. Green quickly became the new white and gave birth to "surgical greens." Soon spinach green itself morphed to a gentler "misty" green. By the 1930s, scrubs included a dusky palette of gray, dark blue, and plum. Today, the garments come in a rainbow of pastels and patterns.

As more colors came into use, one, "ciel" or sky blue, found a niche, one it has held since the 1950s: television. Ciel blue played well on color television, a tool that was increasingly being used as a teaching aid. Thus, more than a century after Holmes proposed the merits of clean clothes for each procedure, physicians were not only pre-

pared to wear fresh, sterile garments, but they were also, it seems, ready for their close-ups.

A Slip of a Thing

The slow pace of medicine's acceptance of gowns and coats was played out in equal manner for the accessories of the trade: gloves, caps, and masks. Oddly, the use of gloves seems to have hit the greatest number of roadblocks, needing nearly 150 years to move from the first published mention to standard use.

Although people had long used gloves to protect their hands against harsh weather and difficult working conditions, it wasn't until 1758 that a German physician, Johann Julius Walbaum, reported to his peers the merits of an obstetrical glove he had developed for in-utero manipulations of a fetus. Walbaum's glove, constructed from the "blind gut of a sheep," was simply drawn over the hand, exposing the thumb and index finger through a four-inch slit while covering the back of the hand and the other fingers.

Walbaum's mitt allowed him to smoothly insert his hand without having it stick to the walls of a woman's vagina or uterus. As an asepsis aid, however, it was a non-starter.

In 1808 a Viennese dermatologist presented the next evolution in the argument for glove use by advising physicians who served as midwives to wear gloves when tending patients with venereal disease, introducing the notion that gloves could protect the practitioner from the patient. Another 30 years would pass before the idea was launched that gloves could also protect patients from their physicians.

In the early 1840s, British physician Sir Thomas Watson made an understated suggestion with profound implications for the management of puerperal fever: "...a glove, I think, might be devised which should be impervious to

The gloves proved to be up to both tasks: Within a year Halsted had slipped a wedding ring on Hampton's now-calmed hands.

fluids, and yet so thin and pliant as not to interfere materially with the delicate sense of touch in these manipulations.”

Watson was on to something. In the early 1800s, chemists had begun experimenting with rubber sap with the aim of finding new applications for it. In the 1830s, Richard Cooke, a young New Jersey physician, described using a latex-based “spirit of turpentine” to make single-use gloves that he painted on his hands before dissections and vaginal examinations and rubbed off when finished. By 1878—the same year the German physician and bacteriologist Robert Koch published his seminal work on wound infection—British and U.S. patents for the manufacture of rubber gloves for surgical operations had been secured.

Most surgeons, however, continued to work ungloved while their assistants and nurses wore gloves only as needed. It was the need of one nurse, in fact, that would lead to the acceptance of gloves in the operating suite of one well-known surgeon of the era—and the spread of their use throughout the profession.

Glove Conquers All

In the late 1880s, William Halsted, a surgeon at Johns Hopkins Hospital, took a special interest in the havoc that the chemicals used to sterilize his surgical instruments were wreaking on the hands of one Caroline Hampton. Hampton was an unusually efficient assistant, according to Halsted, so the work-hampering dermatitis on her hands and arms troubled him.

Halsted was being slightly coy. He was in love—and how better to woo Hampton than to cure her?

Halsted decided to test whether gloves would do the trick. He asked the Goodyear Rubber Company to manufacture “two pair of thin rubber gloves with gauntlets.”

The gloves proved to be up to both tasks: Within a year Halsted had slipped a wedding ring on Hampton's now-calmed hands. Although Halsted was several years away from accepting gloves for his own work, another physician on his team, Joseph Bloodgood, reported in 1899 that his use of gloves during more than 450 hernia operations cut infection rates from nearly 30 percent to next to nothing. The successful use of gloves by members of Halsted's team helped promote their use in surgeries throughout the nation, a moment of progress triggered, as one of Halsted's colleagues put it, when “Venus came to the aid of Aesculapius.”

Gloves evolved in the following decades; the early, tough, reusable rubber coverings had, by the 1930s, become a more flexible, better fitting, “brown milled” item made from a solution of rubber cement. Single-use latex gloves debuted in 1958 and were widely adopted by the late 1960s and early 1970s. Their acceptance was no doubt hastened in 1970 when

hospitals became subject to minimum-wage laws, a move that made the maintenance of reusable mitts—a laborious process carried out by nurses—too expensive to perpetuate.

To Top Things Off

Considering the fashion dictum of coordinating hat with coat, it is unsurprising to learn that surgical caps surfaced in use at the same time as surgical gowns. The German surgeon Gustav Neuber required caps of his surgical team and, in the United States, Hopkins researcher Hunter Robb fanned the flames for their use. In a 1902 report, caps were part of the aseptic technique practiced at New York's Albany Hospital. Three years later, the literature carried correspondence telling of their use by surgeons in Boston, Baltimore, and Cleveland. By the 1930s, microbiological evidence that hair harbored and shed bacteria led to the widespread wearing, although not the mandating of, turbans, shower-cap toppers, and other styles of head coverings during surgeries.

The surgical mask was being promoted for use by surgeons in the late 1800s, but unlike the cap, its use had research backing early. In 1897, German physician Johann Mikulicz proposed the use of masks after research in another laboratory found live bacteria in droplets expelled from the mouth.

A growing body of research showing the dangers of spittle-borne bacteria added evidence to the argument for mask use. In 1905, it was shown that streptococci were disseminated in sputum. And gauze masks worn by physicians helped check the spread of the dreaded 1918 influenza pandemic. The research that nailed the mandatory use of masks came in the mid-1920s, when patients' wound infections were shown to harbor the same organisms found in the noses and throats of the surgeons and nurses who had attended them.

Ready to Care

The physicians who contributed to the development of the gowns, gloves, and other accessories of their profession differed in persona, location, and moment in time. Yet they represent one of those loose leagues of visionaries that recognize a problem and resolve to chip away at its solution. The threads of advice begun by such pioneers as Holmes and Lister provided the foundation upon which progress in the area of antisepsis was achieved. As these pioneers predicted and as research has helped codify—with, perhaps, a dash of television—clothes not only make the doctor, they also make for good medicine. ■

Ann Marie Menting is associate editor of the Harvard Medical Alumni Bulletin.



Johnny Come Lately

It's dubbed a "jahnnny" or a "jahnnny shirt" by some medical professionals. Some coin new terms such as "I-C-U gowns" while others plump the image of these clouds of cotton by genteelly referring to them as hospital gowns.

Several clues can be found to how this ubiquitous garment came to be—and how it came to be called a jahnnny. But its incomplete history hints at the freight of class and status, the comfort of ononymity, and the marbling that time can bring to line and lexicon.

A Breath of Fresh Air

Patient wear did not always feature breezy backsides. For centuries, patients remained fully clothed during examinations. Physicians strategically shuffled clothing layers as they auscultated or

probed, rarely breaching the privacy scrim of their patients' undergarments. By the mid-eighteenth century, those unfortunate enough to enter hospitals would likely have received uniforms. Scholars scrutinizing Johannes Beerblack's 1778 painting of the sick ward at St. John's Hospital in Bruges, Belgium, for example, describe patient ensembles that consisted of turbans and long-sleeved white gowns with red vee necks. Others, researching hospital stays of injured British soldiers during World War I, report that recuperating troopers wore pajama-like outfits, bright blue and pocketless.

In the early 1900s, documents began to describe the dress—and undress—of patients for the medical exam. One of the earliest appears in a 1928 manual on the periodic examination, a health practice only then coming into fashion, written by Eugene Lyman Fisk. Fisk advises physicians to offer women a type of covering that "gives a sense of protection and lessens

embarrassment." He suggests a "specially designed pancha," fashioned from a heavy muslin or sheeting, "which slips over the head and covers the shoulders and body to the knees." To "close" this camely frack Fisk suggests adding small tape ties midway between head opening and hem.

Although Fisk worries the details of the drape for women, his suggestion for what men should wear is sublimely simple: nothing. "Men are examined stripped of clothing," he writes. Fortunately, menswear was not neglected for long; soon men, too, were provided examination gowns, swapping full exposure for mere drafts.

A Search for Meaning

Although patient gowns are found in clinics and hospitals throughout the nation, "jahnny" is not found in everyone's wardrobe of terms. It displays a distinctly regional style.

"'Jahnny shirt' is commonly used in the Maritimes," says Stewart

Cameron, an associate professor of family medicine at Dalhousie University in Halifax, Nova Scotia. "So when a nursing friend moved to Virginia and reported that her use of the term drew blank stares from her colleagues, I was intrigued." Research led Cameron to surmise that referring to hospital gowns as "jahnnies" is not universal. "It seems to occur primarily in the northeastern United States and in eastern Canada."

Medical references, such as *Darland's* and *Stedman's*, are split on the subject, with only *Stedman's* linking the word with medical wear. "Jahnny" as a lowercased noun for such garments also appears in several general dictionaries produced in the United States. And although "jahnny" is listed in the *Oxford English Dictionary*, the ultimate go-to guide for word spelunkers, its slang usages are two—"a man" and "a candam," with nary a mention of hospital gown.

Thumbing through the *Oxford American Dictionary* shows that this usage exists in the United States—but in a limited zip code range. Its geographic popularity, according to Luanne van Schneidmessenger, senior editor of the *Dictionary of American Regional English* (DARE), centers in Massachusetts and Maine.

In a small, back-of-the-envelope survey van Schneidmessenger conducted among colleagues, she learned that "hospital jahnny" is foreign to residents of Illinois, Michigan, Minnesota, and Wisconsin. Since DARE editors were not aware of this regional term for hospital gown when working on the early volumes, this was welcome information to her. "We will indeed add it to a later version of the dictionary," she promises.

The Pajama Game

Just as the use of the term "jahnny" has remained tethered to place, the design of the hospital gown has stayed frozen in time. But recently there has been a thawing of that design, at least at the edges. Some are giving the humble cover-up a more uptown feel by making it fashion wear, while others are modifying it to meet the modesty and style requirements of specific populations.

In the late 1990s, in the hope of providing fancy garments to their patients, New Jersey's Hackensack University Medical Center commissioned the designer Nicole Miller to redesign their patient wear. Her response was Fashion Rx, an exclusive line that banished the column-of-cotton look and replaced it with drawstring pants, pullover tops, and side- and front-snap gowns in colors and "whimsical prints." For nearly a decade, Miller's garments have been provided to all the center's patients, an effort the institution says helps them "take back their dignity and feel at ease in a highly stressful time." This, no doubt, is true: There isn't a skinny tape tie in the lot.

There also are no back ties—or revealing openings of any sort—an garment offered Muslim patients visiting the Maine Medical Center in Portland. When center personnel learned that Muslim women were skipping medical appointments because examination gowns did not preserve the degree of modesty their faith requires, the center had the gown remade to match the new need. All center patients, men and women, now have the option to wear a two-piece ensemble composed of a raamy, long-sleeved top and a floor-length sarong, each available in dozens of colors and patterns.

Discomfort of a different nature led to a line of garments for women undergoing chemotherapy. Wearing a jahnny while awaiting radiation treatment at Massachusetts General Hospital, Margaret Feadaroff felt vulnerable and chilly. With her experience as inspiration, she joined with her two sisters, one of whom was simultaneously undergoing treatment for colon cancer, and developed Healing Threads. The design of this line of garments allows patients to remain covered and comfortable while also providing medical personnel the access needed for the delivery of radiation and chemotherapy treatments. The stylish yet practical line has drawn acclaim from patients—and from the fashion industry's must-read, *Women's Wear Daily*. ■

what



to wear

OUR FAMILY SHARES A PLEASURE

I would never admit to anyone I know, though confessing it to an audience of reading strangers seems somehow different. Each Friday night—like a religious service—we gather in the living room, warm up the television, make a few preparatory snide remarks, and watch our fashion reality show.

In this show, two experts, who are strikingly unfashionable themselves, critique a victim who has volunteered for style dismemberment. Over the course of an hour, they take her wardrobe apart—dress by shirt by shoes. Everything is tossed

into a trash can so swollen it could have undergone collagen treatments. The process is conducted in a bantering but merciless way. No leniency is granted for the outfit she wore the night she met the love of her life.

The willing victim is then given a credit card and access to fine Manhattan boutiques to jumpstart a new style. Watching her shop via

Women and men have been committing sartorial blunders for centuries. Fortunately, physicians have always stood at the ready to diagnose the dangers of fashion.

by ELISSA ELY

minicam, our hosts shake their heads and snicker at her fashion choices, while we in the living room shake our heads and snicker at *their* fashion choices. They are misconceived experts. He wears a sky-blue vest; her lipstick is wrong. The short-sighted are accessorizing the blind here.

After rejecting the clothes she chose for herself, the experts present their client with a wardrobe they selected for her. Hair and makeup people appear, grimace over the raw material, and do their magic. Now the victim is so transformed she hardly recognizes herself, and the

show ends when she is reintroduced to friends and family, who weep the same wondrous tears that different friends and family wept the week before for someone else. The dissected body has miraculously resurrected, and it looks better now. In a trembling voice, one reborn woman said, “I look like someone who can go to law school.”

HOOP NIGHTMARES:
Throughout history,
women have subjected
themselves to discom-
fort and even damaged
their bodies—all for
the sake of fashion.



Wearing hoop skirts made movement difficult, upward with such force that a gracious lady's

CORSET HURTS: The German anatomist Samuel Thomas von Sömmering argued that the corset, by compressing ribs and organs, led to tuberculosis, cancer, and scoliosis.



We snap the TV off after this and pack up for bed. On Friday nights we sleep the sleep of the superior, knowing that this show is ridiculous—fashion is not transformational—and that we ourselves have never stooped to such shallow forms of definition.

A brief tour of history might discomfort us, though. We all stoop to shallow forms of definition, and what's more, we all suffer for it. There is no end to the bad news we have fashionably visited upon ourselves. Let us review.

Maybe it's best to start long ago and at the bottom, with the corset, that manifestation of the upright and staunch. Difficulty breathing was the least of its consequences. The German anatomist Samuel Thomas von Sömmering argued in the early 1800s that the corset, by compressing ribs and organs, led to tuberculosis, cancer, and scoliosis.

Some years later, a British medical treatise identified 97 different female diseases "produced by Stays and Corsets according to the testimony of eminent medical men." Among the alleged and actual ailments were deformed offspring, infertility, hypoxia, hysteria, and melancholy. Those eminent medical men worried; between 1860 and 1890, *The British Lancet* published at least one article annually on the hazards of tight lacing and recommended liberating the waist for health and procreative reasons. The journal's prescriptions went ignored by short-breathed women. Slender silhouettes spoke more persuasively to them than medical eminence.

Hoop skirts, the corset's more opulent cousins, improved neither comfort nor health. Wearing them made movement difficult, and sitting too quickly caused them to fly upward with such force that a gracious lady's nose could be broken. Still, they were worn with-

and sitting too quickly caused them to fly nose could be broken.

out protest, and fashion continued to defy nature; in subsequent eras, bustles prevented sitting down, crinoline prevented getting up, and hobble skirts prevented walking. Fashionable women had little voluntary motion left.

Men were not immune to peril, either. Take the codpiece. Manifestly, it was a statement of virility; covertly, it was perhaps perpetuated by necessity. In the late fifteenth century, Europe was swept by an epidemic of syphilis, untamable in virulence, described by the Veronese poet and physician Girolamo Fracastoro as “pustules...the size of an acorn... constantly discharging an incredible quantity of stinking material.” Treatment was empirical, and male genitals across the continent were swathed in bulky woolen bandages to lessen their swelling. All this created unnatural frontal bulging, a tailoring nightmare. The solution was both discreet and full of innuendo; a man could advertise his potency without advertising his disease.

Textiles, in the mid-nineteenth century, were a rich source of dermatopathology; the effects of fibers, finishes, and fabrics included erythema, lichen, pityriasis, and eczema. Some of the hazard was in the preparation: As they separated fleece into grades, wool sorters were exposed to anthrax. The rest of the risk came in the wearing; flannel underwear caused tinea versicolor and miliaria (though some controversy remains among hair-splitters over whether the culprit was the flannel itself or the coloring), and aniline dye, especially red and magenta shades, inflamed the skin. Even mourning was bad for health; the mordant finishes on English crape caused skin eruptions on widows, and black veils, according to the 1887 manual *Manners and Social Usages*, “shed...pernicious dye into the sensitive nostrils, producing catarrhal disease as well as blindness and cataract of the eye.”

We think we’re wiser now, but we’re not. Elevated heels shorten Achilles tendons, rotate feet internally,

and predispose knees to osteoarthritis. The chemical peel that softens skin also destroys a layer of it. Cell phones, a constant accessory, hyperextend lateral neck muscles. Makeup is a happy home for bacteria (though in ancient times it contained mercury and lead, so perhaps we *have* advanced on that front). And let’s not even mention body piercings.

Fashion is full of hazards. But it offers a few fixes, too. Although knee-high stockings increase spider veins, support hose decrease complications from deep venous thromboses. For \$9.99, a shoe insert recently co-created by an MIT-trained rocket scientist will shift body weight off the endangered ball of a high-heeled foot. Basic white washed cotton shirts are protective against ultraviolet rays—and dyeing the shirts avant-garde blue creates an even more potent barrier. Hands-free cell phones need no neck at all.

It is pleasing to think we can lay salves on conditions we have often caused ourselves. One hopes the great among us will continue to work hard on this. The lesser among us will continue to gather in living rooms on Friday nights, wearing only pajamas, in order to scoff at those who labor to wear so much more. Each week, we are so caught up in family amusement that we forget to discuss the worthier topic: Why bother at all? Humankind uses its intelligence dissonantly, to study the nature of consciousness with one eye and hemlines with the other. Immense efforts go into judging appearances, and then even greater ingenuity goes into altering them, iteration after iteration, seam after seam, merciless reality show after show. Afterward, we always pay for what we have done—it is the one constant in the ridiculousness of a fashionable life. I suspect that’s why we were happier—and safer—in Eden. ■

Elissa Ely '88 is a psychiatrist at the Massachusetts Mental Health Center. She insists that she has no sense of personal style.



THE BEST DEFENSE: The codpiece was worn as a declaration of virility—and perhaps also as a disguise for the woolen bandages used to lessen syphilis-related swelling of the genitals.

costume drama

Diagnosed with breast cancer

IN CASE YOU HAVEN'T HEARD, CANCER IS IN STYLE. Sheryl Crow, Melissa Etheridge, Farrah Fawcett—you can't check out at the supermarket without seeing a celebrity with cancer on the cover of a gossip magazine. It's right up there with the prenuptial baby bumps.

When I learned I had joined the cancer club, my first question naturally was: What do I wear? How can I imagine starring in my own made-for-TV movie about my inspiring battle with cancer unless I nail the costumes?

An early lesson I learned as a cancer patient is that people will say you look fabulous no

matter what. You could be wearing a potato sack. Or you could be wearing nothing at all—on your head anyway—in which case they say you should have embraced baldness much sooner, because your head is beautifully shaped.

I could have taken my inspiration from movies or the theater: think *Terms of Endearment* or *Wit*. But I found those heroines decidedly unfashionable. Or I might have considered the jaunty, in-your-face, upbeat cancer patient images that some women choose. You know, the sweatshirts with angels, the wigs that make you resemble a gaunt hooker, the sequined cowboy hats.

a hospital administrator takes a crash course on dressing the part. *by* JANICE HAYES-CHA



I could have savored the image of myself sipping martinis like the chic Holly Golightly—if only I had had hair, eyelashes, and eyebrows.

Perhaps I should have chosen the sophisticated Jackie O look. *People* magazine featured a photo of her walking through Central Park toward the end of her life. The elegant designer scarf, the trim trousers, the large sunglasses—she looked stylish even with cancer.

For me, cancer treatment suddenly made chic seem attainable: After a double mastectomy and weight loss, a flat silhouette had replaced my Rubenesque figure. As soon as I could, I headed for the Gap and indulged in low-rise jeans. It was the most fashionable I had been in a long time—or so I thought until I learned that flares were so five years ago.

After a month of recovery I returned to work looking like I had been on “Extreme Makeover.” Imagine a transformation from Bette Midler to Twiggy without the cheekbones. My colleagues, when they finally recognized me, simply gushed, “You look fabulous!”

Indeed, for the formerly chubby, cancer-induced weight loss can feel like a blessing. At a neighborhood Christmas party, a nice grandmother who was unaware of my cancer diagnosis urged me, “Eat, eat! You are the skinniest person here!” Well, I wasn’t the thinnest one there, but imagine my elation. I have never been the skinniest person in any room, ever. I could have savored the image of myself sipping martinis like the chic Holly Golightly—if only I had had hair, eyelashes, and eyebrows.

Crowning Glory

Ever the brave cancer lady, I refused to let my hair loss bother me. The barber made a house call to cut off my hair before the rest of it fell off in clumps. My kids loved my step-by-step transformation from a Mohawk, to a Hare Krishna ponytail, and finally to the bald dome of Dr. Evil. I howled with laughter while trying on a series of ridiculous wigs, and I finally settled on one I hoped was flattering.

Once again, my supportive friends agreed: I looked fabulous! After assuring me that it didn’t look like a wig, they added, cheerily, that when my hair grew back I should adopt that style.

Not everyone joined in the you-look-fabulous conspiracy, though. The first day I ventured into the office wigged out, a stylish coworker asked, “Have you thought about wearing a scarf instead?” When no snappy sitcom retort came to mind, I fled to the bathroom, futilely tried to adjust my wig, and fought the urge to cry.

But I did discover one advantage of wigs: They don’t scream out “cancer patient” the way scarves do. Women don’t wear scarves tied artistically around their skulls

unless they are undergoing chemo or just had a facelift. A friend who flew across the country in a scarf had to endure a stranger’s friend-of-a-friend’s gory cancer story before reluctantly reciprocating. For the return trip, she donned a Catherine Zeta-Jones wig and no one bothered her.

Project Runway

The cancer patient makeover does have benefits at times. One friend wore bandanas all summer because she loved it when cancer survivors hugged her. Another friend figured if she got caught speeding, she could always whip off her wig and tell the officer she was racing to chemo. One day she saw flashing blue lights in the rearview mirror—and her plan worked.

My ordeal gave me fresh ideas for Halloween. Flat-chested flapper was one; a family of bald pirates was another. My children wouldn’t budge from their original costume plans, but my husband humored me with a bald cap, sword, and eye patch.

My new look gave me a fresh way to induce guilt as well. One morning, as I was climbing back into bed after dropping my kids off, the phone rang. When I answered, the school nurse launched into a lecture about my trying to sneak my feverish son into school by dosing him with Tylenol. I went to pick him up *au naturel*—pasty, bald, wrinkled, and skinny—and found the stricken look on her face satisfying.

Worse for Wear

Women certainly have an advantage when it comes to provoking sympathy as needed. But men, who can be as vain as women, are expected to be stoic. They also have fewer fashion options. If they wear a wig, they resemble Liberace. Pencil in some eyebrows and it’s Prince. And a bandana only makes them look like they’re auditioning for Bruce Springsteen’s band. They’re best advised to stick with baseball caps, Stetsons, or the preppy fishing hats that Lieutenant Colonel Henry Blake wore in *M*A*S*H*.

Weight loss gives men other fashion challenges. On women, loose clothing looks flowing and relaxed, but men can resemble Barney Fife, Mayberry’s deputy sheriff, as they cinch their waistbands with a belt that nestles somewhere near the armpits. At a formal event, the cancer guy can look like Talking Heads’ David Byrne in the Big Suit, with shoulder pads jutting out over a skinny frame.

Women invest every ounce of their remaining strength in shopping for their new size, and men should follow suit. One man who tackled the cancer look well was



PHOTO: JOHN SPRINGER COLLECTION/CORBIS

DRAMA QUEEN: In the movie *Breakfast at Tiffany's*, Audrey Hepburn played the role of Holly Golightly, a character noted for her eccentric behavior and sleek, chic wardrobe.

Lance Armstrong, who made cancer thin a new fad. He also launched the plastic bracelet craze that has raised millions for cancer research. Great idea, but do the bracelets have to be yellow? A flash of canary may look good on the Tour de France leader as he whooshes past, but as a fashion color, yellow is tough: You can see it for miles, and it turns many people sallow.

Each disease now has its own colored bracelet, as if we're all birds that have been tagged for field studies on migratory patterns. My tag is pink, which some cheerful person picked for breast cancer. I am dismayed to have had a disease that compels me to receive and wear pink items all the time—hats, T-shirts, socks, bracelets. On one trip I took, flight attendants were even selling pink lady cocktails in honor of National Breast Cancer Awareness Month. No thanks; I'll take a beer. I'm not a brave cancer lady in pink. It's just not my color.

So I was thrilled to receive a new cancer accessory called Mel's Bracelets, which are sold in memory of

Mel Simmons, a breast cancer patient who was treated at Massachusetts General Hospital. Not only are these simple strings of colorful beads not pink, but they also benefit the hospital's cancer center, where I received my treatment.

In the end, though, I found my most important costume was the one that could ensure my cure. Superstitious thinking is an important part of cancer treatment. So my fashion statement included Superwoman undies, a black sweatsuit, earrings from my husband, and a necklace strung with patron saint medals for each of my four children. This ensemble became my talisman for every chemo treatment and doctor's appointment. So far it has worked for my breast cancer.

And there's something else that has worked. Every time someone tells me I look fabulous, I believe it. ■

Janice Hayes-Cha is executive director of the MassGeneral Institute for Neurodegenerative Disease.

the Medical fashion tips can come from the unlikelyst of sources. *by* ALICE FLAHERTY proctologist wears prada

EVERYTHING I KNOW ABOUT fashion I learned in hospitals. You might suspect that's a bad sign—and you'd

be right. After all, would you trust clothing advice given by people who consistently break the rule against wearing white after Labor Day? ~ On the first day of medical school, the White Coat Ceremony begins the training students will need to tolerate medicine's frumpiness. Further challenges follow soon after. For me, the second lesson came when a professor mentioned the lipstick sign of returning health. As soon as a female patient begins wearing lipstick again, he said, it shows she is well enough to care about her appearance. I wanted to look healthy, but in the man-sized jacket the hospital had given me, lipstick looked like drag. Naturally I chose looking like a



Besides cardiac code calls, hospitals have fashion code calls. And doctors must call those codes not just on patients, but on each other.

doctor rather than looking healthy, and I avoided lip-stick from then on.

Clothes Ranks

By the end of the first week, all students know that coat reveals rank: short white coat means resident; clean short white coat means medical student. Long white coat tends to be a diagnostic sign for attending. Bespoke white coats are pathognomonic for surgeons. Stiff blue suit coat: residency applicant.

Those blue interview suits—why do people applying to be a doctor dress like drug reps? I used to ask all the applicants that question, until my department chief made me stop. Still, it's sometimes better that an applicant's attire is openly discussed. A few years ago I interviewed a nervous young man in a blue suit and a Brigham and Women's tie. A refreshing variation on the usual red interview tie, I thought, except that the interview was at Massachusetts General Hospital.

Applicants generally relax as the interview progresses, but this young man sounded more and more strangled. My chief is right, I thought sadly, I do ask rude questions. Finally, the applicant stopped speaking altogether. Then he blurted, "The reason I'm wearing a Brigham tie is that when I interviewed there this morning I spilled coffee all over my paisley tie and this is the only kind their gift shop sold!"

With that problem off his chest, the interview went more smoothly.

Ties more often signal subspecialty than physician location: the cartoon ties of pediatricians, the Hermès ties of dermatologists, or the bow ties of gerontologists. Are they growing to dress like their patients, just as researchers start to look like their experimental animals? For the gerontologists, there is a more fundamental safety issue. Even young ones wear bow ties because of the tie sign of dementia—the patient's dementia, not their own progeria. In the tie sign, elderly patients grab the doctor's tie because of a disinhibited grasp reflex. Hospital security guards push even further into the tie fashion frontier with their clip-on ties, which act as quick-release straps when dealing with grabby psychotics.

Patient fashion can be diagnostic as well. Those whose hats are lined with tinfoil need a different ICD-9 code than those who wear gold lamé before the cocktail hour. While latex gloves on an outpatient suggest mysophobia, cotton ones suggest dermatitis. A single cotton

glove on a hand tucked under an arm, though, more often signals reflex sympathetic dystrophy.

To sharpen their diagnostic skills further, eager medical students practice the elevator training drill known as Match the Patient to the Clinic. Patients in dark glasses get off at the cornea clinic. Those in bike helmets head for the seizure clinic. People dressed like construction workers go for the back pain clinic. Women with Macy's bags of spine films: back pain clinic. Men in corsets: back pain clinic.

Frocks for Docs

My fashion education on the wards was often explicit. During one rotation, the other medical student was the sole man. He was pre-ortho, as his crew cut and XL white coat made clear. One day he plaintively asked Patty Gibbons, the junior resident leading the team, "How come you gals don't talk about sports, like on my last rotation? Now it's all about clothes."

She recognized the teachable moment. "You don't find fashion interesting?"

"Oh, I bet it's fascinating. It's just not something I know anything about."

"But that's *treatable*," Patty said. "We'll just add fashion training to rounds. A quiz. Med students love multiple choice. Let's start now. Are my shoes slingbacks or mules?"

Each day we covered a new anatomical area.

"Is this skirt tea length or knee length?"

"Camisole or chemise?"

The medical student was smart. By the end of his rotation he performed well above chance on the quizzes. Several years later he ran into Patty. He had matched in orthopedics, and his coat size was now XXL. "Patty," he said, "I'm so grateful for everything I learned on your medicine team!"

"Does that mean you place internal jugular lines, like we do in medicine, rather than those dangerous subclavian lines, like surgeons?"

"Ah...sure. But also, when I go on a date, I can say things like, 'Nice slingbacks.' And my date always says, 'You are so sensitive!'"

Dressing for Success

Besides cardiac code calls, hospitals have fashion code calls. And doctors must call those codes not just on patients, but on each other: for the silk ascots on those



courting the carriage trade, for the dreary buns, and for other cranial pathologies such as the infinite comb-over—a single mutant hair that coils around and around a bald spot. One clothing historian has postulated that doctors originally adopted the white coat to prevent codes from being called on the pilled, part-polyester gabardine underneath.

One institution that has been relatively free of these morbidities is UCLA Medical Center. This first struck me when I gave a lecture in its psychiatry department a few years ago. The beards were neatly trimmed, there were no novelty ties with brains or Freud on them, and several doctors seemed to be engaging in what ethologists call deceptive signaling: Not only were they wearing white coats despite being psychiatrists, but, even more shocking, their white coats fit.

On a recent trip to Los Angeles, I learned why. While I was on the set of a medical drama there, the costume designer approached me to ask, “Do all New England doctors dress like you? It’s so different from the doctors here.”

I tried to dodge that question with my own. “Where do you get those white coats that fit?”

“At Scrubs Unlimited,” she said. “They do all the Industry. They’re in Westwood, right next to UCLA Medical Center.”

The Plight of Fashion

One of the more emotionally fraught medical fashion cases I’ve seen was that of a middle-aged man whose dopaminergic treatment for Parkinson’s disease made him start cross-dressing openly. This was a variant of a dopamine side effect called punding, an intense and idiosyncratic goal-directed behavior. Mirapex-induced gambling is the example that has received the most press coverage, but I have patients whose drive is to bake bread, rebuild cars, or compose music.

I had heard of this patient for several years before inheriting him from a colleague, and I’m ashamed now that I looked forward to meeting him simply because his symptom was so piquant. By the time he became my

Part of me would rather avoid the fact that my desire not to wear lipstick came from the same neural circuits that produced his desire to wear it.

patient, though, he was so physically debilitated that his cross-dressing had crossed the fine line from comic to tragic. He spent his considerable willpower and last shred of energy on dressing to the nines, but his face and body twisted painfully, and his chiffon dress was drool-stained. My medical training had not taken completely—I remember noticing that the chiffon was white, though Labor Day had passed.

His job as an attorney had helped him become a powerful advocate for the rights of transgendered people. His mission continued even after his death, as his obituaries carried sympathetic coverage of his struggles.

While he was still alive, my patient's wife had responded calmly to his sar-

torial struggles, without pretending his incarnations weren't painful for her. After his death, she was thoughtful about why she had helped him enact the person he had become. She shared with me essays he had written, photographs of the mirrored sculptures he had started making (his punning did not detract from their grace), and testimonials from friends about the ways he had turned his symptoms into strengths.

As a person grappling with illness, my patient had written a moving essay in the *Boston Globe* on what it felt like to stop taking levodopa at nine in the evening and then lie completely frozen until his next dose at six the following morning. He argued that the euphoria

of feeling his body come back to life was worth the living death of the night before. The joy that came through even the frail medium of that newspaper article made me better understand his wife's and his friends' testimonials.

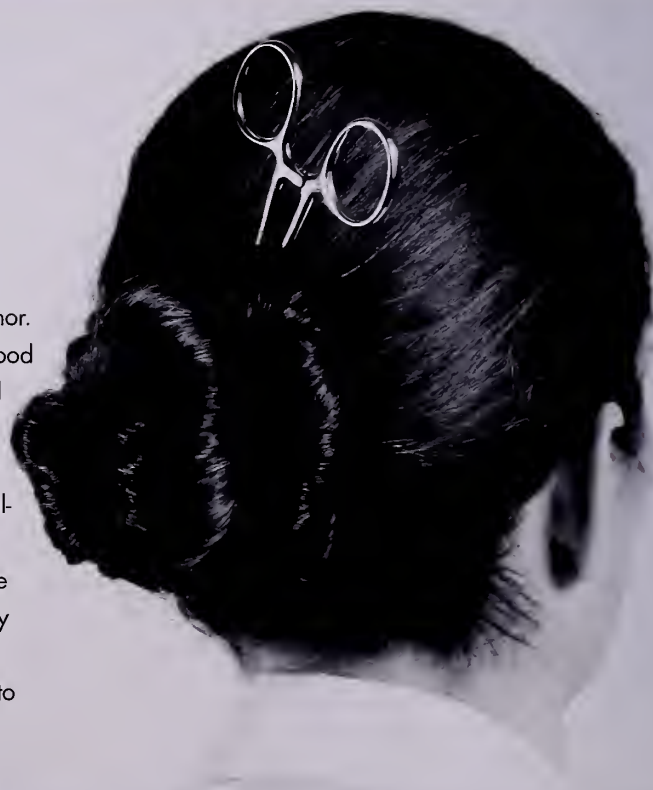
His wife told me about packing up his clothes after his death. "People warn you it will be difficult," she said. "A part of you still hopes that maybe he'll return somehow, and he'll need that shirt. I gave most of the dresses away, and then I hung his old clothes, his suits, back up in his closet. They're the only remnants of his first self."

When I talked to her a few years later, she tweaked that story gently, adding, "Sometimes I use his old crêpe de Chine gowns to help me sleep.

Buns of Steel

Well-chosen fashion can be metaphorical armor in any profession, but in medicine it can also act as literal armor. A hospitalist's white coat should withstand sprays of blood and vomit, while a surgeon's clogs must block dropped scalpels. Residents need clothes that can defend them against an even greater danger: looking frowsy after a call night that includes sleep. Their topmost fashion challenge, at least by its location, is hair.

For me, the solution to bed head was the bun. Once firmly pinned in place, a bun can be indestructible. My bun also made me a quieter, more collegial call-room bunkmate, as in bed it kept me from rolling from side to





They're so wonderfully soft. I don't want to forget his second self either. The love of fabrics he developed; that's one of the things I learned from him."

My patient's drives were dopamine fluctuations, nothing more—but they were also much more. Part of me would rather avoid the fact that my desire not to wear lipstick came from the same neural circuits that produced his desire to wear it. The rest of me knows that in tweed and in chiffon, through will and biochemistry, he did something remarkable with his life. ■

Alice Flaherty '94, a neurologist at Massachusetts General Hospital, recently turned in her hospital-issue white coat for one from Scrubs Unlimited that fits.

side. The next day my bun was looser, true. I could have avoided that with the techniques geishas use—they preserve their buns by coating them with hot wax and by sleeping on wooden neck blocks that support the head in midair. It turned out, though, that I was better off when I looked just a hair less kempt post-call. When my bun was too splendid, teammates would scornfully say, "Apparently you had an easy call night."

A severe bun has long been a trademark of women in medicine, from Dr. Mary Prance in Henry James's novel *The Bostonians* to the impenetrably tight bun of "Hot Lips" Houlihan in *M*A*S*H*. One reason is that buns are practi-

cal as well as ornamental. They can help scare patients into pill compliance, and they're useful repositories for nursing-station pencils and, more uncomfortably, EKG calipers.

In movies, a bun worn by the heroine in the first act is always taken down in the third. She shakes out her hair, and the male lead suddenly realizes she is Julia Roberts. This doesn't happen much in hospitals.

What does happen, at least if your colleagues are neurologists trained to recognize herniations at the back of the skull, is that every once in a while a friend will call across the cafeteria, "Hey, what's that on the back of your head? An encephalocele?" ■



boutique medicine

Wearable technologies are getting smarter, allowing physicians to monitor their patients far beyond the clinic. *by* KEN WILAN

STROKE PATIENTS MAY SOON BE WEARING ITALIAN-DESIGNED gloves as part of their rehabilitation. And people with Parkinson's disease may be selecting an undershirt that confers benefits well beyond those offered by Fruit of the Loom. The next wave of wearable monitoring systems is proving smarter than ever, as form and function merge to produce designs for better living.

With shrinking circuitry, burgeoning wireless technology, and more powerful and specific algorithms, wearable systems that monitor movement, mood, and muscle activity are poised to go from the laboratory to the clinic and the home. Harvard researchers are now developing such devices to facilitate the monitoring and treatment of patients with a range of conditions, including depression, stroke, and Parkinson's disease.

"Most doctor-patient interactions take place on an outpatient basis, allowing the physician only a sliver of time with the patient," says Carl Marci '97, director of social neuroscience at Massachusetts General Hospital. "Part of what's driving the wave of wearable technology is our desire to monitor patients continuously. When we understand more fully each patient's condition on an hour-to-hour basis, we can create better models of care."

Wired for Sound

Efforts to monitor a patient's condition have been around for a long time. It was more than a century ago, for example, that Willem Einthoven invented the mechanism of the electrocardiogram, or ECG. Recent advances have shrunk the size of such devices while computing power has expanded their potential applications. The result has been instruments such as the ring

"It's difficult for patients to report changes in their motor skills objectively. Wearable technology can provide objective measures on a continuous basis."

sensor, which encircles a patient's finger to monitor heart rate, the variability of that rate, blood pressure, and oxygen saturation.

A similar wireless system—dubbed CodeBlue—is currently being developed for use at Beth Israel Deaconess Medical Center by Matt Welsh, an assistant professor of computer science in the School of Engineering and Applied Sciences at Harvard University. Welsh is designing an integrated wireless technology system that will continuously—and unobtrusively—monitor patients waiting in the medical center's emergency department. This iPod-sized device can be worn around the neck on a lanyard. Wired to a pulse oximeter and two ECG leads, the device also features an LCD screen, a button for alerting medical staff in case of emergency, and a pager that allows staff to contact the patient.

Welsh is also applying wireless technology to wearable devices for stroke patients and for those with Parkinson's disease. The devices are about the size of the key fobs used as remote controls for car-door locks. But Welsh expects future models to be small enough to be embedded in articles of clothing or fastened to straps.

Each sensor consists of a microcontroller, a low-power radio to transmit data, and an accelerometer and gyroscope to capture a patient's limb movements. Intel Corporation's Digital Health Group in Cambridge, Massachusetts, developed the platform. Welsh's group wrote the application software running on the sensor, and a research group led by Paolo Bonato, director of the Motion Analysis Laboratory in the Department of Physical Medicine and Rehabilitation at Spaulding Rehabilitation Hospital, has been developing algorithms that will capture and analyze the data. Bonato's group also tests the system and designs different types of wearable devices to suit a range of applications.

Rocket Science

"In designing wearable technologies, we always start with the specific challenges of the clinical problem," says Bonato. In one study, Bonato's team asked a dozen people with Parkinson's disease to perform various tasks while wearing sensors attached to their bodies. Patterns of movement were recorded using the same technology installed on missiles to track their trajectories.

The investigators then analyzed the data for movement patterns associated with various severities of symptoms. Each analysis produced a patient-specific score on the Unified Parkinson's Disease Rating Scale. Bonato found that the approach could predict each patient's level of dyskinesia—an impairment of the abil-

ity to control movements—and bradykinesia—a slowing of body movement. He considers the study one step toward improving the wireless system's functions while also refining the system's design to allow patients greater freedom of motion.

"Managing the symptoms of Parkinson's patients is challenging," says Bonato, "because they constantly evolve. If you adjust a patient's medication, you want to know whether that change is working. It's difficult, though, for patients to report changes in their motor skills objectively. Wearable technology can provide objective measures on a continuous basis. The patient could strap elastic bands with wireless components around the limb that would be most affected by the medication change. The sensors could capture information for a week or so, after which the physician could have the data analyzed. You'd then have a detailed picture of whether the medication adjustment was effective."

Researchers must worry about more than fine-tuning the system and its analytic capabilities; its expense must be tweaked as well. Each prototype now costs approximately \$350, but scaling up production would drop the price per unit considerably. "If I were to build an iPod on my own, it would cost me thousands of dollars," Welsh says, highlighting a technology for which the wedding of miniaturization and mobility produced new applications. "But if we were making 10,000 wearable sensors, the cost would fall to about \$100 each. Some believe it could ultimately drop to \$20."

Reality Checks

For patients recovering from stroke, Bonato studies wearable sensors that could be used to tailor rehabilitation exercises, test the efficacy of different forms of rehabilitation, and determine whether improvements measured in a hospital setting carry over to people's daily lives. For this work, Bonato partners with Joel Stein, chief medical officer at Spaulding Rehabilitation Hospital.

"In the lab, you may be able to demonstrate that patients can move their stroke-weakened arms better after rehabilitation," says Stein. "But when they return home, they may avoid using their weakened arms. Our goal is to extract real-world knowledge of how people are using their muscles."

In the ongoing pilot study, the researchers aim to create better sensor arrays and to validate the algorithms that make sense of the data collected. The study participants have sensors with accelerometers attached to their stroke-affected arms. Measurements are taken during a series of tasks, such as drinking from a can and pushing



MIRACLE FABRIC: Clothing can become a portable monitor of vital signs when it is fashioned from textiles printed with electronic sensors. Such garments offer continuous monitoring of stroke and Parkinson's patients, providing their physicians with ongoing measures of their conditions.

and pulling a weight across a table. Stein says that more sophisticated methods of measuring functionality are needed to judge the effectiveness of newer therapies being applied to stroke rehabilitation, such as robotics, growth factors, stem cells, and brain stimulation.

Other researchers seek to augment patient health through wardrobe accessories, in one case, a "smart" shoe that is both fashionable and musical. Designed to help the elderly, stroke patients, and people with Parkinson's disease retune their gait, the shoe has been tested at Massachusetts General Hospital in research involving a small group of Parkinson's disease patients. The footwear combines thin, pressure-sensor insoles with accelerometers and gyroscopes that are attached to the heels of the patients' own shoes, says Donna Moxley Scarborough, a physical therapist at the hospital and a member of the research team. The sensors work together to measure gait and transmit data wirelessly to a computer, where it is analyzed and fed into a synthesizer. Music is then matched to gait and paced at a tempo researchers hope will, through biofeedback, help the patient become more sure-footed.

Clinically depressed patients also may benefit from wearable monitoring. One study Marci led at Massachusetts General Hospital outfitted such patients with an arsenal of sensors. These included an accelerometer; leads to measure a patient's heart rate, skin conductance, body motion, and location; and a microphone to capture speech patterns—all built to transmit data through Bluetooth technology.

"What really surprised us about some of these features was how well they enhanced our ability to predict where a patient would place on the Hamilton Depression Rating Scale and even that patient's overall ability to function," says Marci. He envisions using sensor-based monitoring for decisions on how to tailor drug dosage and to adjust treatment as a patient's condition changes, much as blood pressure checks now allow physicians to better calibrate treatments for hypertensive patients.

Fashion Therapy

More recently, Bonato's research has begun to blur the line between medical device and clothing. "If the physician needed to monitor the movement of multiple body regions, the patient might have to strap on numerous sensors every day for months," Bonato explains. "After



a few weeks, that patient would tire of the routine, and compliance would disappear."

So Bonato's team is working with materials that have conductive elastomers printed onto the fabric—to eliminate the need to attach wires under a person's clothing—as well as printed on gloves to monitor hand movements. Data-gathering shirts could

track a patient's upper body movement, while sensor-enhanced gloves worn during stroke rehabilitation could both measure hand motion and act as an interface between a patient and a real-time video system that displays the patient's movements on screen.

Some high-end sports gear manufacturers, such as those serving the training needs of competitive athletes, have already created commercial products in the form of machine-washable shirts that measure heart rate, respiration, and posture. Bonato also hopes to weave wireless technology into textiles. He is working with researchers in Italy—at the University of Pisa's bioengineering, biorobotics, and artificial intelligence laboratory and at a company, Smartex—to develop prototypes of such "smart" garments. Bonato speculates that using such material to make everyday clothing would not only enhance data-gathering possibilities but also increase patient compliance.

"The only drawback might be that a shirt would not be in a style the patient would want," says Bonato. "Smartex is looking into different designs to allow patients a range of style options."

The gloves, he adds, offer several advantages over current monitoring systems. At \$10 apiece, they are significantly cheaper than equivalent virtual-reality systems, which cost upwards of \$30,000. "You don't need an expensive platform," Bonato says. "Using spandex, you can produce gloves that fit perfectly, are machine washable, and are so inexpensive that each patient can have a pair throughout rehab."

As for fashion, the gloves can be ordered in an array of colors. And the glove designer's other work? Designing for the fashion house Dolce & Gabbana. ■

Ken Wilan is a freelance writer based in Westborough, Massachusetts.

Girl,

Physicians wait an average of only 18 seconds before cutting short patients' recitations of their symptoms.

by JEROME GROOPMAN

Inter-

rupted

ANNE DODGE HAD LOST COUNT OF ALL THE DOCTORS SHE HAD seen over the past 15 years. She guessed it was close to 30. Now, two days after Christmas 2004, on a surprisingly mild morning, she was driving into Boston to see yet another physician. Her primary care doctor had opposed the trip, arguing that Anne's problems were so longstanding and so well defined that this consultation would be useless. But her boyfriend had stubbornly insisted.

PHOTO: MATTHEU SPORN/PHOTOALTO/VEE



Anne is in her thirties, with sandy brown hair and soft blue eyes. She grew up in a small town in Massachusetts, one of four sisters. Around age 20, she found that food did not agree with her. After a meal, she would feel as if a hand were gripping her stomach and twisting it. The nausea and pain were so intense that occasionally she vomited. Her family doctor could find nothing wrong.

He gave her antacids. But the symptoms continued. Anne lost her appetite and had to force herself to eat; then she'd feel sick and quietly retreat to the bathroom to regurgitate. Her general practitioner suspected what was wrong, but to be sure he referred her to a psychiatrist. The diagnosis was made: anorexia nervosa with bulimia, a disorder marked by vomiting and an aversion to food. If the condition was not corrected, she could starve to death.

Over the years, Anne had seen many internists before settling on her current one, a woman who devoted her practice to patients with eating disorders. Numerous specialists had also evaluated Anne. She had been treated with four different antidepressants and had undergone weekly talk therapy. Nutritionists closely monitored her daily caloric intake.

But Anne's health continued to deteriorate, and the past year had been the most miserable of her life. Her red blood cell count and platelets had dropped to perilous levels. A bone marrow biopsy showed few developing cells. Anne also had severe osteoporosis. One endocrinologist likened her bones to those of a woman in her eighties. Other signs pointed to a failing immune system; she suffered a series of infections. That year she had been hospitalized four times in a mental health facility so she could try to gain weight under supervision.

To restore her system, her internist had told Anne to consume 3,000 calories a day, mostly in easily digested carbohydrates like cereals and pasta. But the more Anne ate, the worse she felt. Not only was she seized by intense nausea and the urge to vomit, but recently she had severe intestinal cramps and diarrhea. Her doctor said she had developed irritable bowel syndrome, a disorder associated with psychological stress. By December, Anne's weight had dropped to 82 pounds. Although she insisted she was forcing down close to 3,000 calories, her internist and her psychiatrist took the steady loss of weight as proof that Anne was not telling the truth.

That December day Anne was seeing Myron Falchuk '67, chief of clinical gastroenterology at Beth Israel Deaconess Medical Center. Falchuk had already received her medical records, and her internist had presented Anne's irritable bowel syndrome as yet another manifestation of her deteriorating mental health. Falchuk heard in the doctor's recitation of the case the implicit message that his role was to poke and prod Anne's abdomen and then to reassure her that irritable bowel syndrome, while uncomfortable and annoying, should be treated as the internist had recommended.

But that is exactly what Falchuk did not do. Instead, he began to question, and listen, and observe, and then to think differently about Anne's case. And by doing so, he saved her life.

Not long after Anne's visit to Falchuk, I met with him in his office to talk about his patient. "Anne was emaciated and looked haggard," Falchuk told me. "Her face was creased with fatigue. And the way she sat in the waiting room—so still, her hands clasped together—I saw how timid she was." Falchuk read her body language: This was a woman beaten down by her suffering. She would need to be drawn out, gently.

Medical students learn that the evaluation of a patient should proceed in a discrete, linear way: You first take the patient's history, then perform a physical examination, order tests, and analyze the results. You formulate hypotheses about what might be wrong, then winnow them by assigning statistical probabilities to each symptom, physical abnormality, and laboratory test. From this, you calculate the likely diagnosis. This is Bayesian analysis, a favored method of decision-making in evidence-based practice that few, if any, physicians actually use.

The physical examination begins with the first visual impression in the waiting room and with the tactile feedback gained by shaking a person's hand. Hypotheses about the diagnosis come to a doctor's mind even before a word of the medical history is spoken. In Anne's case, of course, the specialist had a diagnosis on the referral sheet from the internist, confirmed by the multitude of doctors' notes in her records.

Falchuk ushered Anne into his office, his hand on her elbow, lightly guiding her to the chair that faces his desk. She looked at a stack of papers some six inches high. It was the dossier she had seen on the desks of her endocrinologists, hematologists, infectious disease physicians, psychiatrists, and nutritionists. For 15 years she had watched it grow.

But then Falchuk did something that surprised Anne: He moved those records to the far side of his desk, withdrew a pen from the breast pocket of his white coat, and took a clean tablet of lined paper from his drawer. "Before we talk about why you are here today," Falchuk said, "let's go back to the beginning. Tell me about when you first didn't feel good."

For a moment, she felt confused. But Falchuk offered a gentle smile. "I want to hear your story, in your own words."

Anne glanced at the clock on the wall, the steady sweep of the second hand ticking off precious time. Her internist had told her that Falchuk was a prominent specialist, that the waiting list to see him was long. But she detected no hint of rush or impatience in the doctor. His calm made it seem as though he had all the time in the world.

So Anne began at the beginning, reciting the long and tortuous story of her initial symptoms, the many doctors she had seen, the tests she had undergone. As she spoke, Falchuk would nod or interject short phrases: "Uh-huh," "I'm with you," "Go on."

Occasionally Anne found herself losing track of the sequence of events or tests, but Falchuk did not seem



In a physical exam unlike any she'd had before, he inspected the creases of her palms as though he were a fortuneteller reading her lifelines.



concerned. Instead, he asked her about her recent attempts to gain weight. "Tell me again what happens after each meal," he said.

Anne was sure her internist had told Falchuk about the diet she had been following. But she continued. "I try to get down as much cereal in the morning as possible, and then bread and pasta at lunch and dinner." Yet cramps and diarrhea followed nearly every meal. Anti-nausea medication had greatly reduced the frequency of her vomiting but had not helped the diarrhea.

Falchuk paused. Anne saw his eyes drift away from hers. Then his focus returned, and he brought her into the examining room across the hall. There, he conducted a physical exam unlike any she'd had before. He looked carefully at her skin. He examined her palms, inspecting the creases as though he were a fortuneteller reading her lifelines. He spent a long while looking in her mouth with a flashlight, inspecting not only her tongue and palate but her gums and the glistening tissue behind her lips as well. He also spent time peering at the nails on both her hands and her feet. When the physical exam was over, he asked her to dress and return to his office.

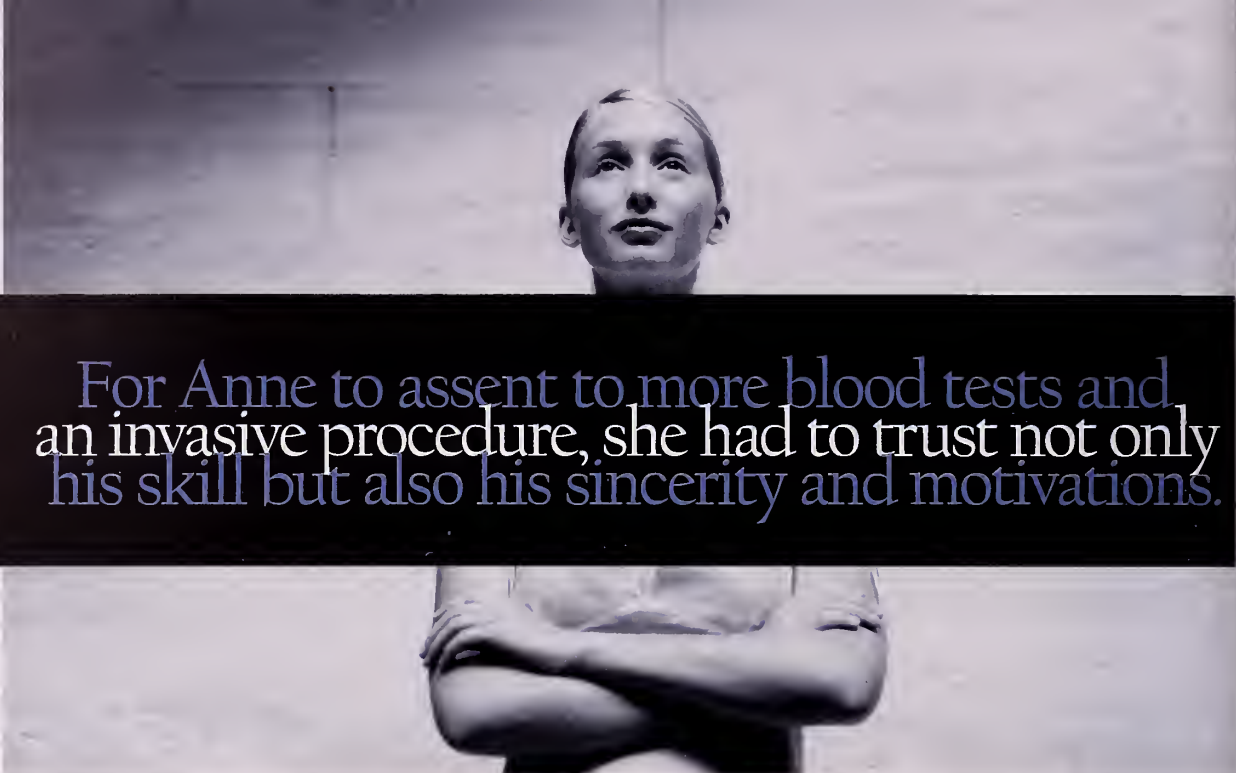
"I'm not at all sure this is irritable bowel syndrome," he said, "or that your weight loss is due only to bulimia and anorexia nervosa. Something else may be going on that explains why you can't restore your weight. I could

be wrong, of course, but we need to be sure, given how frail you are and how much you are suffering."

Falchuk proposed more blood tests, which were simple enough, but then suggested an endoscopy. Anne felt exhausted from the endless evaluations and procedures. Despite his assurances that she would be sedated as the fiberoptic instrument was threaded into her small intestine, she doubted whether the procedure would be worth the trouble and discomfort.

Anne was about to refuse, but then Falchuk repeated emphatically that something else might account for her condition. "Given how poorly you are doing, it may be that your body can't digest the food you're eating, that all those calories are just passing through you."

When I met with Anne one month after her first appointment with Falchuk, she said he'd given her the greatest Christmas present ever. She had gained nearly 12 pounds. The intense nausea, the urge to vomit, the cramps and diarrhea that followed each meal had all abated. The blood tests and the endoscopy had confirmed his suspicion: She had celiac disease. This autoimmune disorder—in essence an allergy to gluten, a primary component of many grains—was once believed to be rare, an illness primarily manifested during childhood. It has since become clear, though, that celiac disease symptoms may not begin until late adolescence or early adulthood, as Falchuk believed occurred in Anne's case.



For Anne to assent to more blood tests and an invasive procedure, she had to trust not only his skill but also his sincerity and motivations.

Anne felt both elated and a bit dazed. After 15 years of struggling to get better, she had begun to lose hope. Now she had a new chance to restore her health.

Tell-Tale Signs

Behind Myron Falchuk's desk, a large sepia-tinged photograph occupies much of the wall. A group of austere-looking men pose, some holding derby hats, some with thick, drooping mustaches.

"That photograph was taken in 1913, when they opened the Brigham Hospital," Falchuk explained. "William Osler gave the first grand rounds." This great icon of modern medicine was acutely sensitive to the power and importance of words, and his writings greatly influenced Falchuk. "Osler essentially said that if you listen to the patient, he is telling you the diagnosis," Falchuk said. "Once you remove yourself from the patient's story, you no longer are truly a doctor."

How doctors think can first be discerned by how they speak and how they listen. Nonverbal communication—the body language of both patient and doctor—plays a role as well. Debra Roter, a professor in the Department of Health, Behavior and Society at the Johns Hopkins Bloomberg School of Public Health, and Judith Hall, a professor of psychology at Northeastern University, have together analyzed thousands of videotapes and live interactions between doctors and patients, parsing phrases and physical movements.

The two researchers have found that the ways in which doctors ask questions and their responses to their patients' emotions are key to what they term "patient activation and engagement." The idea, Roter explained to me, is to encourage patients to feel free, if not eager, to participate in a dialogue. If the patient is inhibited, or cut off pre-

maturely, or constrained into one path of discussion, then the doctor may not learn something vital. Observers have noted that, on average, physicians interrupt within 18 seconds of when a patient begins telling his or her story.

Roter's and Hall's insights can illuminate the case of Anne Dodge. Falchuk began their conversation with a general, open-ended question about when she first began to feel ill. "The way a doctor asks a question," Roter said, "structures the patient's answers." Had Falchuk asked a specific question—"What kind of abdominal pain do you have, sharp or dull?"—he would have revealed a preconception that Anne had irritable bowel syndrome. "If you are unsure of the diagnosis," Roter says, "then a closed-ended question serves you ill, because it immediately, perhaps irrevocably, moves you along the wrong track."

The type of question a doctor asks is only half of a successful medical dialogue. Most patients are gripped by fear and anxiety; some also carry a sense of shame about their disease. "Even if the doctor asks the right questions," Roter said, "the patient may not be forthcoming because of his emotional state. The goal of physicians is to get to the story, and to do so they must understand the patient's emotions."

In addition, Roter says, "Doctors have to convey an interest in hearing what the patients have to say. When a patient tells his story, he gives cues and clues to what the doctor may not be thinking about."

Hall has focused further on the emotional dimension: whether the doctor and patient like each other. She discovered that those feelings are hardly secret on either side of the table. In studies of primary care physicians and surgeons, patients knew remarkably accurately how the doctor felt about them. Much of this, of course, comes from nonverbal behavior: the physician's facial expressions, posture, and warmth of gesture.

Hall discovered that the sickest patients are the least liked by doctors, and that patients sense this disaffection. Overall, doctors tend to like healthier people more. Why is this? Many doctors have deep feelings of failure when dealing with diseases that resist even the best therapy; in such cases they become frustrated, because all their hard work seems in vain. So they stop trying. In fact, few physicians would welcome patients like Anne Dodge warmly. Consider how much time and attention caregivers had given Anne over those 15 years, without a glimmer of improvement.

Roter and Hall also studied the effect a doctor's bedside manner has on successful diagnosis and treatment. "We tend to remember the extremes," Hall said, "the genius surgeon with an autistic bedside manner, or the kindly GP who is not terribly competent. But the good stuff goes together—good doctoring generally requires both. You need information to get at the diagnosis, and the best way to get that information is by establishing rapport with the patient. Competency is not separable from communication skills."

Make No Mistake

The more Falchuk observed Anne, and the more he listened, the more disquiet he felt. "It just seemed impossible to absolutely conclude it was all psychiatric," he said. "My intuition told me that the picture didn't entirely fit. I began to wonder: What was missing?"

When Falchuk told me that the picture didn't fit, his words were more than mere metaphor. Doctors frame patients all the time using shorthand: "I'm sending you a case of diabetes and renal failure," or "I have a drug addict here in the ER with fever and a cough from pneumonia." Often a doctor chooses the correct frame and all the clinical data fit neatly within it. But a self-aware physician knows that accepting the frame as given can be a serious error. "It's like DNA evidence at a crime," Falchuk explained. "The patient was saying 'I told you, I'm innocent.'" Here is the art of medicine, the sensitivity to language and emotion that makes for a superior clinician.

Intellect and intuition, careful attention to detail, active listening, and psychological insight all coalesced on that December day. Falchuk had asked himself, "What might I be missing in this case? And what would be the worst thing that could be missed?"

What if he had not asked himself those questions? Then Anne, her boyfriend, or a family member could have asked them. But patients and their loved ones lack the doctor's training and experience.

In Anne's case, it was Falchuk who asked simple but ultimately lifesaving questions, and to answer them he needed to go further. And for Anne to assent to more blood tests and an invasive procedure, she had to trust not only his skill but also his sincerity and motivations.

This is the other dimension of Roter's and Hall's studies: how language, spoken and unspoken, can give information essential to a correct diagnosis and persuade a patient to comply with a doctor's advice. "Compliance"

can smack of paternalism, casting patients as passive players who do what the all-powerful physician tells them. But without trust and a sense of mutual liking, Anne probably would have deflected Falchuk's suggestions of more blood tests and an endoscopy. She would have been "noncompliant," in pejorative clinical parlance. And she would still be struggling to persuade her doctors that she was eating thousands of calories a day while wasting away.

No doctor is right all the time. Every physician, even the most brilliant, makes a misdiagnosis or chooses the wrong therapy. This is not a matter of a "medical mistake," such as prescribing the wrong dose or viewing an x-ray backward. Misdiagnoses provide a window into the medical mind. They reveal why doctors fail to question their assumptions, why their thinking is sometimes closed or skewed, why they overlook the gaps in their knowledge.

Experts studying misguided care have recently concluded that most errors can be attributed to flaws in physician thinking, not technical mistakes. In one study of misdiagnoses that caused serious harm to patients, some 80 percent could be accounted for by a cascade of cognitive errors, placing a patient into a narrow frame and ignoring information that contradicted a fixed notion.

Another study found that inadequate medical knowledge was the reason for error in only four of a hundred incorrect diagnoses. The doctors stumbled because they fell into cognitive traps. Such errors produce a distressingly high rate of misdiagnosis. As many as 15 percent of all diagnoses are inaccurate, according to a 1995 report in which doctors assessed written descriptions of patients' symptoms and examined actors simulating patients with various diseases. These findings match classic research, based on autopsies, which shows that 10 to 15 percent of all diagnoses are wrong.

The skewing of physicians' thinking leads to poor care. What is remarkable is that so few patients understand the effect of a physician's negativity on their medical care and change doctors because of it. Rather, they often blame themselves for complaining and taxing the doctor's patience. Patients may be able to resolve the problem with candor. But when I asked other physicians what they would do if they, as patients, perceived a negative attitude from their doctor, each one flatly said he or she would find another doctor.

As for Anne Dodge, she's alive because she found another doctor—one who listened. ■

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To protect her privacy, the name and certain identifying characteristics of the patient have been changed.

by DAVID B. SACHAR

Will lessons from recent natural calamities spur us to improve our medical response system? Or will we continue to count on the initiative of physicians and the resilience of patients?

THE AFTERMATH

Ten long minutes had passed. My entire body ached as I continued to brace myself over the convulsing woman. I was struggling to hold her airway open with several tongue blades—the only medical equipment on hand—while also trying to prevent injury to either of us as her 350-pound body worked through the grand mal seizure. Then my cell phone rang.

I somehow answered it, juggled it well enough to recognize the voice of my superior in the Office of Reserve Affairs in Washington, DC, and told him respectfully that I'd call him back.

Twenty minutes later, the woman now calmed with intravenous Valium and en route to the hospital, I returned the officer's call. I had barely uttered my name when he barked, "Sachar, where the hell are you?"



FAMILY TIES: Sisters reunite in San Antonio in September 2005 after each had been evacuated separately from New Orleans following the devastation of Hurricane Katrina.

In for a Penny

The easy answer would have been, "San Antonio, Texas, sir." But even though my insignia as a captain in the U.S. Public Health Service had barely been broken in when Hurricane Katrina swooped out of the Gulf and swept me into emergency service in Texas, I knew that any answer, short or long, would come with problems.

I wasn't exactly new to the service. I had recently reactivated my commission, one I had held since the 1960s when I served for two years at what was then known as the Cholera Research Laboratory in East Pakistan, now Bangladesh. Yet in that pair of active-duty years—and in the 38 years that followed—I had never given a salute or put on a uniform, much less learned how to wear one

properly. In short, I had no sense of what it meant to be an officer in a uniformed service.

So, phone to my ear, I proceeded to explain why I was where I was.

"I'm in north San Antonio, helping take care of 250 special-needs evacuees who were bussed in last night."

"Who told you go there?"

"The field commander."

"Where did he get his orders?"

"I dunno; from the higher-ups, I guess."

"Dammit, Sachar, I'm your higher ups."

My attempt at further explanation was cut off as my superior told me I'd better talk to a captain from the Health Resources and Services Administration. He handed her the phone, and I explained things all over again.



EVERY STEP OF THE WAY: The citizens of San Antonio, Texas, welcomed nearly 13,000 people from New Orleans following Hurricane Katrina. The first stop for most of the evacuees, like this young girl searching for her mother with the aid of a San Antonio police officer, was a temporary shelter set up in the plant of Levi Strauss & Co.

"So," she said, "if I understand you, the need on the ground suddenly became critical, the field commander determined that you were needed there more urgently than at your regular station, and so he moved you there to help out with an emergency."

"Exactly!" I exclaimed.

There was a long pause. "Well," she finally pronounced, "I'm comfortable with that." I felt a rush of relief; even in a regimented environment, reason can prevail.

Make Ready

When I reflect on my brief stint as a public health physician in Texas following hurricanes Katrina and Rita, I find myself thinking most about the people I worked with and the evacuees we assisted. But those memories increas-

ingly are being crowded by my worries over how—or whether—we are improving our preparedness for the next mischief Mother Nature may bring our way.

My experience in San Antonio informed my work as a physician and provided me with a valuable perspective on emergency response procedures. It also showed me the flaws in the system—the operational barriers to the effective placement of personnel and equipment, the jumbled communication between agencies separated by geography and administration, and the weak integration of the functions of federal agencies. Although developing solutions to these problems will depend largely on decisions made by our congressional representatives, the search for solutions could also benefit from the insight of those who were in the trenches: medical personnel, civil personnel, and the evacuees.

I know institutional, organizational, and administrative lessons can be learned by analyzing our responses to these disasters. I also know there are personal lessons to be found, ones I benefit from every day. My service has become a source of inspiration to me, fed by the stories and spirit of my fellow responders, and, most especially, of the evacuees themselves.

Those Who Stand and Wait

After the devastating tsunami of December 2004, I had decided to reactivate my U.S. Public Health Service commission and to make it meaningful. I undertook the two-week Basic Officer Training Course and became a captain in the service, the only one of the nation's seven uniformed services with a primary mission of "protecting, promoting, and advancing the health and safety of the nation."

When Hurricane Katrina hit several weeks after my course, I knew I

needed to sign up for active duty. If I didn't, I thought, then what the heck was I doing hanging around this planet? So in a flash I signed up. In another flash I received orders. There I was, on active duty, assigned to go to an as-yet unspecified location to help with the relief effort.

I packed, readied my uniform, and put my life and commitments on hold for 30 days. I stood ready. And stood ready. My active duty orders may have been issued, but my travel orders were yet to be processed. Personnel activation orders, it turns out, come from one place; duty assignments come from another; and travel arrangements from a third.

When those orders finally arrived, I learned I was to travel to San Antonio, where I would join other officers as well as volunteers from around the country. For our first week, we were assigned to assist with a special-needs population. Our enormous building was a rabbit warren consisting of four common sleeping areas with nearly 500 cots each, countless tiny cubicles, and seemingly endless corridors that stretched as long as city blocks. We were supplied with a scattering of office furniture, several blood pressure cuffs, a hodgepodge of medication samples, a handful of finger-stick glucose meters, and a few vials of insulin. Notably absent were examining areas, laboratory facilities, adequate medical equipment, and pharmaceutical supplies.

By the time we arrived, people with acute trauma had already been treated. The patients awaiting us had chronic conditions—diabetes, hypertension, high cholesterol, or asthma—for which they had been receiving long-term care. That care had ended, though, when they were violently uprooted from their homes, their health care providers, and their medications. Almost without exception

informed my work as a physician and provided me with a procedures. It also showed me the flaws in the system.

these patients needed prescriptions refilled. Only rarely did they have the prescriptions or medication bottles in hand; often they knew only that they needed the “little white pills” or the “round pink pills.”

Lost and Found

The professional support of the Barrio Comprehensive Family Health Care Center staff represented a source of inspiration to me. Patients were in and out of the rooms in the blink of an eye, whisked seamlessly to the laboratory or the pharmacy, their charts always at hand. Even more remarkably, if a doctor stepped into the corridor and looked puzzled for an instant, a nurse or assistant immediately materialized to inquire what might be needed or how he or she could help.

Similarly, the people of San Antonio were warm and friendly. Bus drivers stopped to offer directions, while passengers chimed in with additional advice. The city's officials also were incredibly hospitable to the evacuees. Not only did they provide free food, clothing, and medical and pharmaceutical care, but they also offered free housing in unoccupied houses and apartment units for a full year.

Yet despite the sterling examples of the uniformed corps and selfless volunteers and the uplifting behavior of support staff and citizenry, the evacuees proved my true wellspring of inspiration. Who were they? The New Orleans evacuees tended to be poor and African American. Some families fled together; others were scattered far and wide. Most knew where their relatives were; many did not. Yet they had one thing in common: They had lost everything. To the last man and woman, they had lost their homes, their jobs, and all their belongings.

The people we saw in our clinics, of course, had also lost their health care

support. The patients' initial complaints often proved far less significant than their true medical problems. One woman showed up in the clinic bothered by a runny nose. On the way out, she quietly asked if we could refill her prescriptions. What did she need? Oh, four medicines for her high blood pressure; two sets of pills plus insulin for her diabetes; inhalers, a nebulizer, and medications for her asthma; antibiotics because of her rotting teeth; and other pills for anxiety, depression, headaches, and insomnia.

A mother brought in an eight-year-old with a sore throat. Were there any other issues? Well, he was receiving treatment for attention deficit hyperactivity disorder, oppositional-defiant disorder, bipolar disease, and Asperger's syndrome. And could he have a note for school?

And then there was the elderly woman who told me, a gastroenterologist specializing in Crohn's disease, that she had been diagnosed with that disease 40 years earlier. She had undergone one operation, had taken one Azulfidine tablet each day thereafter, and had never had any more trouble with the disease. I refrained from telling her that evidence-based medicine said she was taking the wrong approach; I'd rather tell the bumblebee that aeronautical engineers say it can't fly.

Most memorable, however, was a middle-aged man who insisted he needed attention only for his sore throat, although he had acknowledged to his wife that his legs were “feeling a little heavy.” And indeed they were, swollen to double their normal size with edema. His lungs gurgled with fluid, his neck veins bulged, and his heart rate galloped. His blood pressure, meanwhile, was 240/120 and his breath smelled uremic. With a little more prying we learned he was diabetic and that his doctors at Tulane had

been treating him for three years in a valiant effort to keep him off a kidney machine a while longer.

These Katrina victims with their ruined houses, broken lives, and compromised health remained stolid, stoic, and philosophical. They were alive, and they felt comforted by their faith. They would survive without complaint and without anger. They had touched bottom in the storm, but their heads were still above water.

As Good as Gold

At the farewell dinner for our group, a field commander stood to speak. With his crew cut, steely eyes, stern expression, and battle fatigues and boots, he looked like central casting's idea of a Russian assassin in a James Bond movie. His words belied those looks, however. He spoke with charm and wit, concluding his comments with the thought that every life has its golden moments and that this period of service represented one of those moments for him.

I realized then—as I realize now—that I, too, had experienced one of life's golden moments in San Antonio. My fellow officers and other volunteer professionals had taught me the meaning of comradeship and pride in service. The people of San Antonio had taught me the spirit of compassion. And the evacuees—those brave “internally displaced citizens”—had taught me that tragedies come but that faith is strong and life is stubborn. ■

David B. Sachar '63 is a clinical professor of medicine at the Mount Sinai School of Medicine in New York, where he is also director emeritus of the gastroenterology division. Since his service in Texas, he has taken the U.S. Public Health Service's Advanced Officer Training Course, which focused on emergency medical responses to such catastrophes as bioterrorism and chemical accidents.

DEBTORS'

The burden of medical student debt can lead young doctors to defer their dreams. by JANICE O'LEARY

PRISM

THE IRONY IS THAT WELL-INTENTIONED INSTITUTIONS OFTEN LEND A hand, making it possible for students to enter medical school. But as graduation nears and students prepare for the next phases of their careers, the reality of debt sometimes locks students into decades of financial struggle, narrowing their dreams and stunting their potential reach.

Three-quarters of the 165 students entering Harvard Medical School each year seek financial assistance, and the amount each student borrows has crept up annually. In 2005, HMS students graduated with an average debt of \$101,000. While this figure is well below the national average of \$138,000 for private medical schools, School officials want to bolster aid, especially since the number of students graduating with debt topping \$150,000 doubled from 2005 to 2006.

Although some of that increase can be attributed to the rise in dual-degree candidates who acquire an extra year of loans, such debt concerns School officials. Even more worrisome, they say, are its consequences: alumni so hampered by student loans they delay the next stages of their personal and professional lives.

PHOTO: STOCK/SCIENCE/GETTY IMAGES



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Beverly Aist Zavaleta

DEBTOR: Beverly Aist Zavaleta '00

OWES: \$170,000 in student loans and \$150,000 on a start-up practice loan

DREAMS DEFERRED: Spending time with her children and possibly ensuring the success of her medical practice

Primary Share

AFTER FOUR YEARS OF MEDICAL SCHOOL, THREE years of a family medicine residency, and three years in private practice, Beverly Aist Zavaleta '00 no longer wonders where the times goes: It's eaten away by working harder and harder to see more patients to pay off loans to keep her practice afloat, which cuts into the time she could be spending with her children.

Nor does she wonder where the money goes. After her loan payments are made, Zavaleta takes home only a tenth—about \$600—of her monthly income. The payments on the money she borrowed to open her primary care practice sail away at \$3,000 per month. For now, HMS, through a new loan repayment assistance program, pays 90 percent of her \$1,800-per-month student loan payments. But next year, when the term of assistance runs out, she might have to close her practice.

Zavaleta left medical school with \$170,000 in student loans, the equivalent of a mortgage in San Antonio, where she lives. “You can buy a really nice house for that in Texas,” Zavaleta says. During school and her internship year, the loans were in forbearance, so they didn’t earn interest. But she feared they would grow astronomically during her residency, when the principal balance would be deferred but interest would start to accrue. “When you make only \$30,000 a year,” she says, “you can’t afford to live and pay the interest on such a large sum.”

She thought she’d found her salvation: the Primary Care Loan of the U.S. Department of Health and Human Services. With its fixed, 5-percent interest rate and deferred interest during residency until she got a job, the loan seemed tailored for her. What Zavaleta didn’t realize was that the term of repayment for the loan would be 10 years instead of the usual 30 and she wouldn’t be eligible for graduated or extended payment plans. She discovered these fine-print terms just as she opened her own practice with a partner.

“I may not have started this practice if I had realized I had only a decade to repay the loan,” she says. “When I finally understood what I faced, I panicked. I was afraid I’d have to declare bankruptcy, quit medicine, and move to New Zealand to raise sheep.” Instead, she called HMS.

That call was her true salvation. Zavaleta learned about a new program at the School that helps graduates who enter lower-paying fields, such as public service or primary care. “I argued on my application that primary care is, by nature, public service,” Zavaleta says. For every Medicaid patient she sees, for instance, she loses \$50. But she needn’t have worried over her application plea; she was exactly the kind of graduate HMS hoped to help.

Zavaleta says the family’s dependence on her husband’s income has trapped him as well. “He has missed career opportunities,” she says, “because he’s locked into making a certain amount to run the household.”

She tries not to let the worry about their finances accrue its own interest and saves where she can. Lunches are packed, not purchased. Her two children wear mostly hand-me-downs. And vacations are distant dreams.

“If I had more money,” Zavaleta says, “I could afford to spend more time with my kids. The worst part of all of this is that childhood is brief, and I’m missing theirs. Even if our financial picture brightens in another decade, I can’t go back in time.” ■



PHOTO: JEANMARIE FIOCCHI-MARDEN

Helping Hands

With the generous assistance of its alumni, Harvard Medical School has danned surgical gloves to stanch student debt. HMS Dean Joseph Martin has earmarked the entire Alumni Fund for scholarships, and as much as 90 percent of the aid that students receive from the School now comes through alumni giving. “With the challenges of ever-rising educational debt driving students into careers of profit rather than passion,” Martin says, “alumni giving is even that much more meaningful.”

To supplement this giving, the School has established—through an all-Harvard initiative—two programs aimed at alleviating debt: the HMS Loan Repayment Assistance Program (LRAP) for young alumni with modest incomes but high debt and the Public Service Initiative for graduating students matching in lower-paying fields.

“It’s rare among medical schools to have an institutional repayment plan,” says Robert Caughlin, HMS director of financial aid. Alumni who qualify for the LRAP receive checks from HMS—totaling between \$1,000 and \$13,000 over six months—that they then apply to their loan balances. Graduates can reapply for the assistance every six months for up to five years. Fourth- and fifth-year students who match in the traditionally lower-paying specialties and who owe more than \$50,000 can apply to have a percentage of their debt wiped out. Last year, the program’s first, a dozen students felt the reassurance of that institutional helping hand. ■

For more information about the aid programs, visit www.hms.harvard.edu/finaid and click on “Links.” To participate in scholarship giving, go to www.hms.harvard.edu/ard.



PHOTO: THIS SPREAD: LIZA GREEN

DEBTOR: Patricio Gargollo '00

OWES: \$110,000 in student loans

DREAMS DEFERRED: Starting a family and pursuing a career in academic medicine

Shadow of a Debt

AT NIGHT, AS HE LOOSENS THE TENSED MUSCLES of his shoulders and hands and prepares for his next 12-hour shift of pediatric surgeries, Patricio Gargollo '00 finds his mind returning not to the series of tiny sutures he threaded through a child's bladder, but to the ever-tightening mental knot of worries over his future.

The \$110,000 cloud of his student loans already casts a shadow on his career as he calculates how deep a cut into his income his monthly loan payments will make. Will he take the full 30 years to pay the debt off? Or should he change his path so he can pay it off early and not still be making payments when his future children enter college? He dreams of entering academic medicine, but if he maintains a practice he could earn triple what teaching would pay. Can he and his wife afford to

DEBTOR: Siobhan Wescott '08

OWES: \$55,000 in student loans and \$40,000 in credit card debt

DREAM DEFERRED: Residency

Seven-Year Hitch

SIOBHAN WESCOTT '08 WAS A CANCER EDUCATOR FOR several years preceding medical school. She learned that many cancer patients didn't understand the basics of their own illnesses. She educated them, but wanted to go one better; she wanted to help heal them.

That goal still seems far off. Right now, Wescott feels stalled. She hesitates at the threshold of residency, worried about

how financially devastating it will be. Knowing her wallet will feel even lighter than it already does, she postponed residency until next year, delaying also the day she'll need to begin paying the interest on her student loans.

If she sticks to her plan of practicing pediatric hematology/oncology, she faces six years of making about \$40,000 a year, less than she receives now in scholarship and financial aid. At the same time her expenses will be higher. She'll still be paying on the \$40,000 she put on credit cards during her years at HMS, but she'll also have interest payments on her education loans. She'll need a car, which will come with the twin shackles of monthly insurance and loan payments. Her financial dilemma distracts her, even while she's in the midst of her sub-internship at Massachusetts General Hospital.

"Sometimes I feel like medical school was an expensive mistake," she says. "I feel like a pauper now, and I'm in denial about how hard it will be later. As it is I feel bad going to the occasional movie. Ten dollars seems like a lot."

An Athabaskan who grew up in Fairbanks, Alaska, Wescott qualified for a scholarship to HMS through the Indian Health Service but opted against it because of its restrictions: She would have had to practice primary care and be willing to work wherever the service placed her. If she changed her path from primary care, she would have had to repay—in just one year—three times the amount she would have received, which would have totaled nearly \$1 million.

Wescott fears she won't qualify for HMS repayment programs because the starting salary in her intended specialty averages \$175,000. She would like to return to Alaska, where she would be only the second pediatric hematologist/oncologist. But at least seven belt-tightened years separate her from a time less strapped by financial unease. ■



start a family this decade? Can they afford to wait? Where can they buy a house and both find jobs?

During his undergraduate years at Baylor University in Texas, a scholarship limited the amount Gargollo needed to borrow to just \$10,000. But in medical school, debt was inevitable. Again, he felt lucky to receive a scholarship, but he still needed to borrow nearly \$100,000 and to work part time during his four years.

The cost of living in Boston has made life even harder. Now it's affecting his career trajectory; he and his wife are considering moving south where their dollars could go further.

"My student debt has really affected our ability to have a family, our freedom to choose where we live, and the direction of my career," Gargollo says. "Finances are the big reason we put off having children for so long. I worry about my debt all the time."

Without Gargollo's wife's income, he wouldn't be able to prevent his loan from growing during his many years of training at Children's Hospital Boston. Already

he and his wife scrimp, trying to throw money toward the accruing interest on that principal balance, which is in deferment until his urology fellowship ends.

Gargollo always knew he'd have to make compromises to do what he loves—pediatric surgery, a specialty that entails a six-year residency and a three-year fellowship. That's four years of taking out loans followed by nine years of making very little money. He isn't afraid of sacrifice; born in Mexico City, at age seven he immigrated to the United States with his father. But his early lessons about sacrifice haven't made the road smoother.

"All this debt is jeopardizing my dream of going into academic medicine," he says. "I'm still on that path, but I'm worried sick about it."

And as he continues to help heal children in the operating room he hopes some day soon he can hold one of his own. ■

Janice O'Leary is the assistant editor of the Harvard Medical Alumni Bulletin.

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